SOCIAL AND PUBLIC POLICY

2014:17

PUBLICATIONS OF THE DEPARTMENT
OF SOCIAL RESEARCH 2014:17

ON GOVERNANCE OF QUALITY SHIPPING IN THE BALTIC SEA

Daria Gritsenko

PUBLICATIONS OF THE DEPARTMENT
OF SOCIAL RESEARCH 2014:17

ISBN 978-952-10-9131-5

ON GOVERNANCE OF QUALITY SHIPPING IN THE BALTIC SEA

EXPLORING COLLECTIVE ACTION IN POLYCENTRIC CONTEXTS

DARIA GRITSENKO

Department of Social Research
University of Helsinki
Finland

ON GOVERNANCE OF QUALITY SHIPPING IN THE BALTIC SEA

Exploring Collective Action in Polycentric Contexts

Daria Gritsenko

ACADEMIC DISSERTATION
To be presented, with the permission of the Faculty of Social Sciences of the University of Helsinki, for public examination in lecture room 2, Metsätalo, Unioninkatu 40, on 08 November 2014 at 12 noon.

Publications of the Department of Social Research 2014:17
Social and Public Policy

Cover: Jere Kasanen
Cover image: Günter Fruhtrunk, fragment from *"Zehn metastabile Kompositionen" (1963),*
Museum am Ostwall, Dortmund, Germany.

Distribution and Sales:
Unigrafia Bookstore
http://kirjakauppa.unigrafia.fi/
books@unigrafia.fi
PL 4 (Vuorikatu 3 A) 00014 Helsingin yliopisto

ISSN-L 1798-9140
ISSN 1798-9132 (Online)
ISSN 1798-9140 (Print)
ISBN 978-952-10-9131-5 (Print)
ISBN 978-952-10-9132-2 (Online)

Unigrafia, Helsinki 2014

ABSTRACT

This dissertation aims at clarifying how multiple public and private decision-making actors co-exist in the governing of shipping quality in the Baltic Sea, and which mechanisms allow these multiactor arrangements to proliferate and sustain themselves. Acknowledging that collective action problems undermine quality governance, this research sought to collect empirical evidence documenting the role of polycentricity, which implies the existence of overlapping and competing centers of decision making embedded within multiple interdependent – and often conflicting – contexts, for quality shipping and the way it is conceptualized, operationalized, and practiced. A key argument in this thesis is that whereas the shipping industry is global, quality shipping governance is not; therefore, quality shipping governance takes a form of contextually-bound steering.

Quality shipping is defined in this research as shipping that aims at safety and environmental protection, while still maintaining economic sustainability. The two central aspect of quality in shipping – safety and environmental – were used to empirically grasp and operationalize quality shipping in four individual studies conducted within this dissertation project. The individual empirical studies do not build upon each other directly, however they are linked thematically, conceptually, and methodologically, and allow for interconnected, though varying insights on the emergence and development of collective action by revealing how the practices associated with quality shipping were defined and materialized. The empirical research was built upon reconstructing the governance process on the basis of 'methodological localism', that is, focusing on actors who are involved in the process of steering, their interactions, and how institutions structure the interaction within multiple interconnected contexts in which interactions are embedded.

This thesis relates to the wider body of research on governance by focusing on how quality shipping governance cuts across different levels and jurisdictions and penetrates the grey zones in which neither markets nor states can solely solve collective action problems. Reflecting on the impact of multiactor interaction that connects different functionalities and localities, it contributes to four interconnected theoretical debates on governance: on the role of politics and power, on the territorial dimension of boundary-spanning governance, on the new role images and dilemmas, and on governing of governance, or metagovernance.

This dissertation makes an empirical argument to support the proposition that quality shipping governance is not a technical depoliticized process of problem-fixing, but a battlefield overrun with power struggles and conflicts over resources, images, and institutions. The four individual studies portray much of the interaction in existing quality shipping governance as informal and ad hoc, and emphasize that everyday inter-organizational exchanges constitute the larger part of interactions between shipping actors in governance of quality shipping. It further speculates about the role of metagovernance and interactions that allow actors to establish mechanisms that link vertical (hierarchical) and horizontal (market and network) dimensions of governance. The thesis claims that if we want more quality shipping, we need to be able to explain and master the connecting relation between actors and institutions that enhance multiactor coordination and make collaboration work.

The practical contribution of this study is in elaborating a framework for formulation and implementation of socio-economic innovation for balanced development and public well-being in polycentric contexts using the example of quality shipping governance. The focus on concrete instances of collective action in quality shipping governance in the Baltic Sea demonstrates that interactions, institutions and mechanisms vary in time and space. This finding has important implications for solving social and environmental challenges in arenas other than shipping, because it shows that collective action is contextually-bound and that local solutions can be found to problems conventionally identified as global.

TIIVISTELMÄ

Väitöskirjassa selvitetään, miten useat julkiset ja yksityiset päätöksentekijät toimivat samanaikaisesti merenkulun laadunhallinnassa Itämerellä ja mitkä toimintatavat mahdollistavat eri osapuolten yhteistyön lisääntymisen ja ylläpidon. Tutkimuksessa todetaan, että yhteistoiminnan ongelmat heikentävät laadunhallintaa. Väitöskirjassa osoitetaan empiirisen aineiston pohjalta, että polysentrismillä on keskeinen rooli laadukkaan merenkulun hallintojärjestelmässä. Polysentrismillä tarkoitetaan sitä, että päätöksentekoon osallistuvat eri tahot ovat keskenään päällekkäisiä ja kilpailevia sekä toimivat usein ristiriidassa keskenään, minkä ajatellaan vaikuttavan laadunhallintaan ja sen toteuttamiseen. Väitöskirjan keskeinen argumentti on, että vaikka merenkulku on maailmanlaajuista, merenkulun laadunhallinnan on oltava kontekstisidonnaista.

Tässä tutkimuksessa laadukkaalla merenkululla tarkoitetaan merenkulkua, jonka toiminnallisia tavoitteita ovat turvallisuus ja ympäristönsuojelu sekä taloudellisen kestävyyden ylläpito. Väitöskirjan empiirinen osa koostuu neljästä osatutkimuksesta, joiden kahta keskeistä aspektia - turvallisuutta ja ympäristönsuojelua - käytetään toiminnallisten määritelmien perustana. Osatutkimukset liittyvät yhteen käsitteellisesti ja metodologisesti ja esittelevät toisaalta yhtenäisiä, toisaalta vaihtelevia näkemyksiä yhteistoiminnan syntymisestä ja kehittymisestä. Neljässä osatutkimuksessa todetaan, että tämänhetkinen merenkulun laadunhallinta on usein luonteeltaan epävirallista ja tilapäistä sekä korostetaan, että organisaatioiden tavanomainen keskinäinen kanssakäyminen muodostaa suurimman osan vuorovaikutuksesta hallintaprosessiin osallistuvien toimijoiden välillä.

Väitöskirja on osa laajempaa hallinnon ja hallinnoinnin tutkimusta. Tutkimus keskittyy siihen, miten merenkulun laadunhallinnassa käsitellään ns. harmaita alueita, joiden yhteistoiminnan ongelmia ei voida ratkaista yksinomaan valtioiden tai markkinoiden taholla. Väitöskirjassa pohditaan sitä, miten eri toimijoiden keskinäinen vuorovaikutus eri toimintatasoilla ja lainkäyttöalueilla mahdollistaa useiden toimintatapojen ja paikkojen yhdistymisen. Tutkimuksen empiiriset havainnot pyrkivät osoittamaan, että merenkulun laadunhallinta ei ole pelkästään ’tekninen’ ongelmien ratkaisun prosessi, vaan taistelukenttä, jossa konfliktit resursseista, roolimalleista, ja instituutioista sekä muut valtataistelut ovat keskeisiä. Teoreettisella tasolla väitöskirja antaa kontribuution neljään hallintokirjallisuuden keskusteluun: politiikan ja vallan rooli, rajoja venyttävän hallinnan alueellinen ulottuvuus, uudet roolimallit ja niiden problematiikka, sekä ns. meta-hallinta eli hallinnon hallinta.

’Metodologinen paikallisuus’ valittiin empiirisen tutkimuksen pohjaksi, koska se mahdollistaa hallintoprosessin rekonstruktioinnin. Menetelmä keskittyy hallintojärjestelmän toimijoihin, niiden keskinäiseen vuorovaikutukseen sekä niihin instituutioihin, jotka rajaavat yhteistoimintaa lukuisissa yhteen liittyvissä konteksteissa, joihin toimijat on sidottu. Keskittymällä konkreettisiin yhteistoiminnan tapauksiin Itämeren merenkulun laadunhallinnassa tutkimus osoittaa, että toimijoiden keskinäiset vuorovaikutukset, instituutiot ja toimintatavat vaihtelevat ajassa ja paikassa.

Tutkimuksen keskeinen väite on, että mikäli merenkulun laatua halutaan parantaa, toimijoita ja instituutioita yhdistävää suhdetta tulee pystyä selittämään ja hallitsemaan. Siten useiden eri toimijoiden toiminnan yhteensovittamista ja toimijoiden keskinäistä yhteistyötä voidaan edesauttaa. Käyttäen laadukkaan merenkulun hallintaa esimerkkinä, tutkimuksessa kehitetään analyyttista pohjaa sosioekonomisten innovaatioiden, tasapainoisen kehityksen ja julkisen hyvinvoinnin suunnittelua ja toteuttamista varten. Tutkimuksen havainnoilla on merkittävä vaikutus yhteiskunnallisten ja ympäristöhaasteiden ratkaisemiseen muillakin aloilla kuin merenkulussa koska ne osoittavat, että yhteistoiminta on kontekstisidonnaista ja että perinteisesti maailmanlaajuisina pidettyihin ongelmiin voidaan löytää ratkaisuja paikallisesti.

CONTENTS

ABSTRACT ..... - 3 -
TIIVISTELMÄ ..... - 4 -
ACKNOWLEDGMENTS ..... - 9 -
Original publications and manuscripts ..... - 11 -
INTRODUCTION ..... - 13 -
1.1 Preliminary considerations ..... - 13 -
1.2 Research question and objectives ..... - 14 -
1.3 Scientific and practical relevance ..... - 16 -
1.4 Reflections on non-epistemic values and cognitive practices ..... - 18 -
BACKGROUND ..... - 21 -
2.1 Why contextualizing? Establishing the research setting ..... - 21 -
2.2 Shipping and the environment ..... - 23 -
2.2.1 Emissions and discharges from shipping ..... - 23 -
2.2.2 Public regulation of emissions and discharges from shipping ..... - 25 -
2.2.3 Other measures addressing emissions and discharges from shipping ..... - 26 -
2.3 Commercial shipping in the Baltic Sea ..... - 27 -
2.3.1 Baltic maritime transport patterns ..... - 27 -
2.3.2 Baltic natural context and shipping ..... - 30 -
2.3.3 Baltic institutional context and shipping ..... - 31 -
2.3.4 Environmental impact of shipping in the BSR ..... - 32 -
2.4 The Baltic Sea as a context for quality shipping ..... - 36 -
THEORETICAL CONSIDERATIONS ..... - 38 -
3.1 Collective action and collective action problems ..... - 38 -
3.2 Defining and operationalizing quality shipping ..... - 41 -
3.3 Quality shipping in the framework of collective action ..... - 43 -
3.4 Core concepts to theorize quality shipping and their interrelations ..... - 47 -
3.4.1 Governance ..... - 47 -
3.4.2 Institution ..... - 51 -
3.4.3 Polycentricity ..... - 54 -
3.4.4 Actor and interaction ..... - 56 -
3.5 Tracing the process of quality governance through individual studies ..... - 60 -
METHODOLOGY ..... - 61 -
4.1 Metatheoretical commitments ..... - 61 -
4.2 Linking ontology and methodology: institutions, causal mechanisms and mixed methods research ..... - 65 -
4.3 Methods of data collection and analysis ..... - 70 -
4.3.1 What is data? A broad perspective ..... - 70 -
4.3.2 Data collection ..... - 71 -
4.3.3 Data analysis ..... - 73 -
4.4 Limitations and potential shortcomings ..... - 77 -

INDIVIDUAL STUDIES ..... - 80 -
5.1 The Russian Dimension of Baltic Maritime Governance ..... - 81 -
5.2 Varying Patterns in Vessel Operational Quality and their Governance Implications ..... - 83 -
5.3 Governing Shipping Externalities: Baltic Ports in the Process of SOx Emission Reduction ..... - 85 -
5.4 Quality Governance in Maritime Oil Transport: the Case of the Baltic Sea ..... - 86 -
DISCUSSION ..... - 89 -
6.1 Too many cooks? ..... - 90 -
6.2 Too many rules? ..... - 91 -
6.3 How do(es) context(s) matter? ..... - 92 -
6.4 How not to spoil the broth? ..... - 94 -
CONCLUSIONS ..... - 96 -
7.1 Theoretical implications ..... - 96 -
7.2 Policy recommendations ..... - 97 -
7.3 Looking ahead ..... - 99 -
List of abbreviations ..... - 101 -
REFERENCES ..... - 102 -

To my parents

ACKNOWLEDGMENTS

Autumn always feels to me like a new beginning. This autumn feels even more so, as it started with an academic promise envisaged in this thesis: to never stop marveling at the ever changing world of social phenomena surrounding us. The joy of scientific endeavor that I partook over the past five years would not have been possible without my academic advisors, colleagues, family, and friends and I would like to extend my deepest gratitude to all the infinitely curious human beings who I encountered along this way.

I begin my acknowledgments with my academic advisors: Esko Antola, who demonstrated vivid interest in my project and assisted me in establishing myself as a doctoral student in Turku; Kimmo Rentola and Louis Clerc, who took care of me and my dissertation's well-being during my work in the Department of Contemporary History at the University of Turku in 2010-2011; Johanna Yliskylä-Peuralahti, who not only co-supervised my thesis and introduced me to the Center for Maritime Studies at the University of Turku, but also became my co-author, critical listener, and a fair-minded advisor, who's scrupulousness and precision helped me in fulfilling my tasks to 110%; and finally, my custos and main thesis supervisor, Veli-Pekka Tynkkynen, who posed many challenging questions, punctured my arguments, destroyed my sandcastles, and brought me outside of my epistemological comfort zone, thereby helping me to keep things clear and simple, stay coherent and trustworthy, avoid overstretching and overthinking, and finish my thesis on schedule. I also owe special thanks to Markku Kivinen, a "God-father" of this thesis, who helped guide me down the road toward a PhD with his down-to-earth, practical remarks and words of encouragement. Thank you all for your guidance and friendship.

I am grateful to Michael Roe and Björn Hassler, who kindly agreed to serve as pre-reviewers for my thesis and provided me with comments and motivation crucial to the completion of this work. A significant part of my research has emerged as a result of collaborative efforts and I express deepest appreciation to my co-authors – Michele Acciaro, Tuomas Kiiski, Tim-Åke Pentz, Miluse Tichavska, Beatriz Tovar, Kimmo Vehkalahti – for their patience, hard work, healthy criticism, and commitment. I would also like to thank all the anonymous reviewers who accepted and rejected my papers, for thorough and fair peer-review, which I believe to be the grounding principle of contemporary scholarly work.

I want to recognize the grants and fellowships that I received, especially my positions in the Graduate School for Integration and Interaction in the Baltic Sea Region (2010-2011), coordinated by Heli Rantala, and in the Finnish Doctoral Programme for Russian and East European Studies (2012-2013), coordinated by Hanna Ruutu and Ira Jänis-Isokangas. I consider myself to be lucky to have been a member of these two graduate schools, as without these affiliations I would not have met Jonathan L'Hommedieu, Dragana Cvetanovic, Emma Hakala, Anna Halonen, Tuomas Hovi, Miia Ijäs, Markus Kainu, Tuomas Laine-Frigren, Mila Oiva, Ira Österberg, Jaakko Turunen, Freek van der Vet, and Dmitry Yagodin, a group of talented, determined, and open-minded young scholars with whom I enjoyed modernizing my thinking in Havsvidden and elsewhere. I am indebted to the inspiration that these people have provided and continue to provide.

I am also grateful to my colleagues from the Department of Contemporary History at the University of Turku, especially Markku Jokisipilä, Auli Kultanen-Leino, Mikhail Kurvinen, Ville Laamanen, Heli Leppälä, Erkka Railo, Timo Soikkanen, and all who made me feel welcome in the little wooden building in Arwidsoninkatu. I would also like to thank my colleagues from Unioninkatu, 33 – Aleksanteri-instituutti – which had become my second home for more than two years and where work and fun, sweets and yoga, criticism and support have been always in the right balance due to presence of versatile and warm-hearted people, including Sari Autio-Sarasmo, Tuomas Forsberg, Vladimir Gel'man, Jouni Järvinen, Niina Into, Tapani Kaakkuriniemi, Markku Kangaspuro, Suvi Kansikas, Anna Korhonen, Eeva Korteniemi, Emilia Marttunen, Katalin Miklóssy, Hanna Peltonen, Saara Ratilainen, Marja Riikonen, Anna-Maria Salmi, and Anna Salonsalmi. During the final year of my doctoral studies, I was honored to become a researcher in the Academy of Finland project "CHIP – clean shipping economics – shipping under the new paradigm" and I am grateful to Ulla Tapaninen and all project members for high spirits in our team.

I would also like to acknowledge Helge Hellberg and Lars Friedrichsen, as they introduced me to the world of Baltic Sea affairs and shipping policies and encouraged to pursue my doctoral studies in Finland – without their initial impulse this dissertation would have never been conceived. A very special thanks goes to Tarja Hyppönen and Minna Oroza, who encouraged me to establish myself as a teaching instructor, thereby challenging me to look for the right words to speak about my research to different audiences. The colleagues from the Research Seminar in Environmental Policy led by Janne Hukkinen and Eeva Berglund have been of invaluable help in the completion of my thesis. Finally I would like to express a deepest appreciation to all mentors, teachers, and critics I encountered during these years at numerous summer schools, conferences, workshops, and seminars, as each comment, piece of advice, disproval, argument, and encouragement I ever received made me reconsider my work and strive for the best I could deliver.

It has been my privilege to work and live closely to those kind and smart people, whom I with a great sense of delight refer to as my friends. Thank you dearest Bogdan Iancu and Erla Eliasdottir for tea-and-cookies discussions about the sense of everything; Brendan Humphreys for being an empathic office colleague and a personal English language advisor; Jonathan Kamkhaji for thoughtful commentaries and musical offerings; Helena Nurmikari for Finnish language assistance; Tommi Penttinen, Joanna Pylvänäinen, Olli Törmä, Anna Tuhkuri, and other TYYn and EOLin kuorolaiset for the joy of singing together; Natalia Diaz, Maria Iolyeva, Alexandr Kibasov, Simon Oswald, Yves Peeters, Olga Popova, Vitaliy Yanko, Felicitas Uhl, and all other (non-)academic friends who supported me during these five years – thank you for being there for me, rain or shine. Much appreciated!

There are four people on my mind whose invaluable moral and financial support, eternal love, acceptance and sense of humor made this work possible: my parents Victoria and Andrey Gritsenko and my grandparents Antonina and Nikolay Shoriny. To them I dedicate this work.

Helsinki,
09 September 2014

Original publications and manuscripts

This thesis is based on the following publications and manuscripts, referred to by their Roman numerals in the text:

I Gritsenko, Daria, 2013. The Russian Dimension of Baltic Maritime Governance. In *Journal of Baltic Studies*, 44(4), pp. 425 - 449.

II Gritsenko, Daria and Kimmo Vehkalahti, 2013. Varying Patterns in Vessel Operation Quality and their Governance Implications. In *Proceedings of the International Forum on Shipping, Ports and Airports (IFSPA)*, Hong-Kong June 3-5, 2013, pp. 473 - 484.

III Gritsenko, Daria and Johanna Yliskylä-Peuralahti, 2013. Governing Shipping Externalities: Baltic Ports in the Process of SOx Emissions Reduction. In *Maritime Studies* 12:10.

IV Gritsenko, Daria, 2014. Quality Governance in Maritime Oil Transport: the Case of the Baltic Sea. *Submitted.*

INTRODUCTION

1.1 Preliminary considerations

The study of collective action is at the core of social research. How people work together to produce collective goods and avoid collective bads is a major concern in the disciplines of political science and public policy, but has also obtained a prominent position on the research agendas of economists, legal scholars, sociologists, anthropologists, and social philosophers. In the field of public policy, collective action has been researched in multiple settings, including the realm of environmental policy, which has been a prominent subject-matter in collective action research starting from the late 1960s (Zurn, 1997; Carter, 2001).

Specialized literature started to emerge in relation to various types of environmental problems; investigating their origin and social implications (Ehrlich, 1968; Commoner, 1971; Meadows et al., 1972; Baumol and Oates, 1993; Wall, 1994), addressing the instrumentation of environmental public policy and developing assessment mechanisms to improve policy performance (U.S. Congress OTA, 1995; OECD, 1997; Portney and Stavins, 2000; Jordan et al., 2003; Crabbe and Leroy, 2008), studying the role of public authority and private actors (Haas et al., 1993; Princen, 1994; Wapner, 1996; Pattberg, 2007), scrutinizing the relationship between different levels and scales of environmental policy shaping, making, implementation, and progress (Eckersley, 1992; Young, 1994, 2002). The inherently complex and transboundary character of environmental problems required distinct treatment capable of exploring how interactions between human activities and natural processes are bound to certain geographical areas; this in turn led to the appraisal of environmental topics in area and regional studies (Johnson and Corcelle, 1989; Haas, 1990; Young and Osherenko, 1993; DeSombre, 2000; McCormick, 2001; Weidner et al., 2002; Keeley and Scoones, 2003; Oldfield, 2005); also in the Baltic Sea region (BSR) studies (Hjorth, 1992; Joenniemi, 1993; Scott, 1997; Joas et al., 2008; Speck et al., 2006)

The present study can be placed at the intersection of two research lines: on the one hand it looks into the Baltic Sea as a multidimensional context for shipping governance; on the other hand it scrutinizes commercial shipping as an activity prone to collective action problems that cause environmental distress. This research project contributes to the study of collective action in the maritime realm by emphasizing how solutions to collective action problems related to the governance of quality shipping are context-dependent. Through empirical studies it shows how both the subject-matter of shipping and specific conditions in the Baltic Sea as a geographical setting add value to social scientific explanation, challenge the notion of generally applicable (or ‘commonsensical’) knowledge and highlight the unique character of each collective action situation. It further suggests that whereas polycentric systems of order are a source of unique problems, they can also be a source of unique solutions. Finally this research contributes to the topical societal discussion of how governance of global environmental problems shall be organized by developing the ‘small is beautiful’ philosophy (Schumacher, 1973) and presenting arguments in support of interactive governance, the principle of subsidiarity, and community-driven innovation (e.g., via the professional maritime community or regional expert community).

Economic, political and social developments around the Baltic Sea, in one way or another, have all impacted Baltic shipping, which is one of the essential services enabling connections between commercial activities of the region. Changes in Baltic shipping over the past twenty years include intensification of shipping, changes of freight structure and port throughput, expansion of ports and terminals, as well as introduction of multiple measures aimed at improved safety and the improved environmental performance of seagoing vessels. Major negative consequences have so far been avoided; comparison of environmental performance indicators over the past years suggests that the goal of reduced vessel-based emissions and discharges was accomplished (Section 2.2.4 presents a more detailed discussion of this subject). Yet, this does not mean that quality shipping was actually achieved. Though an increase of pollution and accidents would be consistent with theoretical predictions – as shipping can be seen in a classical 'tragedy of the commons' framework (Hardin, 1968) – empirical evidence from the Baltic Sea does generate quality shipping governance examples where socially desirable outcomes can occur, or at least socially undesirable outcomes can be prevented. The empirical investigations reported in Articles I-IV present the development of quality shipping in the Baltic Sea as an interactive process in which mechanisms of collective action have emerged and been consolidated in order to address and resolve social dilemmas are all deeply rooted within their contexts.

1.2 Research question and objectives

The awareness of the negative environmental impacts of global shipping has risen over the last two decades (Mitchell, 1994; Tan, 2006; Corbett, 2007; OECD, 2011). In relation to this, the question of quality in shipping has gained increasing attention from policymakers, the shipping industry, and other societal actors challenged with balancing safety, environmental protection, and economic sustainability in maritime transport (the concept of quality shipping is presented in Section 3.2). This dissertation seeks to contribute to this debate by exploring the phenomenon of quality shipping from a social scientific point of view, i.e., as a collective action problem, pursuing the overarching topic of quality shipping through reconstructing governance as collective action within the shipping sector. To further advance the argument, shipping governance is conceptualized as a phenomenon prone to polycentricity, which implies the existence of multiple centers of decision making and policy implementation operating simultaneously within an encompassing system of rules, but in the absence of central authority (Section 3.4.4 elaborates further on the concept of polycentricity). The attempts to resolve the adverse effects of Baltic shipping by aiming at an increase in quality poses several fundamental questions regarding the role of polycentricity in addressing multifaceted transboundary societal concerns, in particular (1) how multiple public and private actors at different levels and scales co-exist in governing shipping quality in the Baltic Sea; and (2) which institutional mechanisms allow the emerging multiactor arrangements to proliferate and sustain themselves? This dissertation aims at clarifying these questions on the basis of empirical data, pondering how quality governance mechanisms can be shaped in multiple interdependent contexts, and how these polycentric interactions transform shipping practices.

A research question always inherently includes a hypothesis about the relationship between the particular phenomena under investigation. Among the central intuitions of this study that were made explicit by theorizing quality shipping within the framework of collective action is the analysis of institutions as mechanisms structuring multiactor governance processes in a number of overlapping contexts and featuring multiple centers of authority. In order to address this broad research agenda, a series of empirical research questions was formulated: Which actors are engaged in the management of emissions and discharges and how do they interact? To which rules, norms and strategies they adhere? How do political-administrative and economic institutions influence their choices? Which mechanisms can be associated with the governance of quality in shipping? These empirical questions – relevant to understanding the means by which actors develop mechanisms to engage with the problem of vessels-based pollution and assure a certain degree of quality through collective action – were developed in individual studies, all of which provided individual contributions to answer the central research question. To operationalize the questions, all the individual studies were organized in accordance with the following research objectives: (1) scrutinizing the governance practices at the level of aggregated groups of actors, including ship owners, charterers, insurers, classification societies, cargo owners, authorities, and consumers; (2) revealing the mechanisms that facilitated the emergence and development of rules, norms, and strategies that defined and materialized practices associated with quality shipping; (3) assessing the effects of polycentricity and the role of multiple (and often conflicted) contexts in which governance takes place. Each of the studies contributes variously to each of the objectives, and together they allow the uncovering of the puzzles of collective action in quality shipping governance.

This research project was motivated by a normative goal of contributing to the improvement of the environmental state of the Baltic Sea. One of the factors that accounts for the degradation of the Baltic ecosystem is the emission of pollutants and harmful discharges from shipping. Basing on the knowledge derived from previous research and preliminary understanding of the phenomena, the real-life problem (mitigating emissions and discharges from seagoing vessels) was translated into abstract-theoretical terms (governance of shipping quality), which allowed the research to be framed within the scope of topics considered to be within the social sciences and the discipline of public policy studies. Claiming that emissions and discharges from ships into water, air, and shores are not only a matter of technical imperfections of shipbuilding or unavoidable part of operational routine, the study also considers them as a matter of decisions and practices among the actors involved into maritime transportation of goods. In maritime studies and shipping economics “self-evident” (commonsensical) assertions that fragmented authority and overlapping jurisdictions are the source of institutional failure to deliver more quality have focused the scholarly investigation upon the design of incentives and compliance rules. Yet, it has been shown that in domains that exhibit the properties of polycentricity alignment of rules and incentives at a single level and/or in a hierarchical manner cannot be accomplished (Brondizio et al., 2009). The thesis suggests reconsidering the “self-evident truths” (Ostrom, 2000) that are being invoked in the conventional framing of collective action problems in the governance of environmental

change and natural resource management and attention is paid to the specific circumstances in polycentric contexts. Thus, an in-depth investigation of the de-facto system of ordering in shipping is a prerequisite for any corrective policy intervention. In the light of the need for a better understanding of the institutional dynamic within contemporary maritime governance, the analytical goals of this dissertation are three-fold: (1) to establish shipping as a domain akin to polycentricity; (2) to investigate polycentric orderings in shipping (existing and/or potential); (3) to suggest how limited systems of order within shipping can be extended to allow for better inter-organizational coordination in quality governance.

Methodologically the research was built upon reconstructing the governance process by which shipping quality is addressed. The four individual studies have the following functions in unfolding how multiactor arrangements emerge and what makes their governance efforts effective. Articles I and II shed light upon the polycentric and multileveled nature of shipping governance. Article I takes a macro-level perspective to reveal the peculiarities of maritime governance through exploration of the Baltic Sea region as a politico-administrative area in which shipping takes place. Article II shifts the level of analysis to a more close investigation of individual vessel performance to open up Baltic shipping as a functional area of quality practices. Articles III and IV present two case-studies, the first in SO_x emission reduction and the second in oil transportation, on the basis of which in-depth empirical investigations show how the functionality of shipping as an area of operational activity performed in the specific politico-administrative circumstances of the Baltic Sea region gave rise to the emergence of particular types of quality governance mechanisms.

The overall interest in studying governance through collective action has been central to all stages of the research process: at the initial stage it assisted in the operationalization of central concepts, at the concluding stage, it allowed to specify the theoretical contribution on the basis of empirical investigation. The focus on concrete instances of collective action in quality shipping governance in the Baltic Sea allowed the revealing a number of different mechanisms, which indicates that their list is incomplete and that such mechanisms may vary in time and space (see Section 6). This finding has important implications for solving social and environmental challenges in arenas other than shipping, because it proves that collective action is contextually-bound and that local solutions can be found to problems conventionally denoted as global, as will be discussed in the final section in more detail (see Section 7.1).

1.3 Scientific and practical relevance

This research has normative, theoretical, and empirical motivations. Whereas during the last two decades shipping practices have changed and maritime practitioners are well aware of the gradual transformation in attitudes towards shipping quality, little research has been done on quality shipping governance prior to that. In the literature, the global maritime industry has long been pictured as “the archetype of unbridled free-market capitalism” (Lillie, 2013, p.1), until single contributors challenged this view by not taking for granted this assumed proposition, but rather by paying attention to the actual dynamics within maritime business. The works by P. Bennett, M. Bloor, N. Lille, M. Roe, E. DeSombre sought to show and explain variation in maritime governance patterns by focusing on diversification and the

layering of regulatory arrangements and self-governance practices. These academic endeavors opened up the area of maritime governance for contributions and new viewpoints. The goal of this dissertation is to contribute to existing arguments by elaborating on the role of polycentricity in facilitating collective action.

The influence of globalization upon governance practices is not unique to the shipping sector, as the transformation of societal steering into a contextually defined process of interaction among various actors and institutions at different levels and scales is a widely-described phenomenon (Cerny, 1995; Rosenau, 1997, 2003; Selkou and Roe, 2004). Beyond the subject-matter of shipping, the effects of this societal transformation – often referred to as decline of the Westphalian system (Rosenau and Czempiel, 1992) – upon the governance practices and patterns of collective action are scrutinized in studies related to "wicked problems" (Rittel and Webber, 1973) in the areas of public policy and planning, including environment (Jentoft and Chuenpagdee, 2009; Biermann, 2010; Balint et al., 2011), the internet (Mueller, 2004, 2010), and money laundering (Levi, 2002; Huesse, 2007; Tsingou, 2010), to name just a few. These studies have contributed significantly to improving the understanding of how public and private governance practices are exercised jointly and separately from another.

The discussions on the role and impact of power, the ways to measure governance as a process of collective decision making, the paths to the institutionalization of governance, exploring the spatial dimension of governance, the understanding of role dilemmas and especially the role of the state, the influence of mass media, and the impact of governance of public innovation have taken a few steps ahead in advancing our empirical and theoretical knowledge about governance. Yet, there are many understudied and unexplored issues. Torfing et al. (2012) identified gaps and limitations in these emerging sub-literatures, in particular in respect to understanding interactive forms of governance and Aligica and Tarko (2012) called for more empirical examples to increase our knowledge about polycentric systems. The need for further normative assessment of governance focused on the ability of governance to deliver effective, democratically accountable, and transparent way of steering societal affairs was also emphasized (Bäckstrand, 2006; Torfing et al., 2012, pp. 235-236).

This research seeks to relate to the wider body of research on governance by focusing on how governance cuts across different levels and jurisdictions and penetrates the grey zones in which neither markets nor states can solely solve collective action problems. Reflecting on the impact of multiactor interaction that connects different functionalities and localities, this thesis supports the proposition that "human actors are able to solve some collective-action problems on their own without external rules and enforcement imposed from the outside" (Ostrom 2010a, p.155) by bringing new empirical evidence on the functioning of governance and the various forms of collective action. It extends the existing research beyond the common-pool resources (CPR) agenda: solutions to collective action problems associated with the negative environmental impacts of shipping operations are introduced as questions of comprehensive quality governance rather than mere pollution prevention. The perspective offered treats shipping activities as simultaneously belonging to several contexts (natural, functional, economic, and politico-administrative) and assumes multiple contexts to lend

complexity to social organization manifested through institutional diversity. This complexity, however, is not anarchy, but rather a (partially) ordered polycentric system. The distinct feature of polycentricity, understood here as a "complex system of powers, incentives, rules, values, and individual attitudes combined in a complex system of relationships at different levels" (Aligica and Tarco, 2012, p.247), is that polycentricity implies the existence of multiple centers of decision making *within* the institutional and cultural framework that provides an overarching set of rules (the intellectual tradition discussed in Section 3.4.4).

Asserting the inherent polycentricity of quality shipping governance the proposed theoretical perspective seeks to resolve the contradictions, which cannot be addressed within traditional analytical frameworks that concentrate on hierarchical ordering of governance practices. Classical divides (micro/macro, local/global, homogeneity/heterogeneity, conflict/cooperation, individual/collective) are not treated as separate units of analysis; their interconnectedness is emphasized by reliance on synthetic assumptions (for discussion of ontological and methodological alignments see Section 4.2). Finally, the interactive governance perspective provides for the integration of multiple considerations (plurality of actors, institutions, levels of action, centers of authority, contexts, etc.), that allows the bypassing of the restrictive definition of levels of analysis, and concentrates rather on exploring quality shipping by identifying the contingency of the emerging governance mechanisms.

The awareness of the environmental and safety performance of Baltic shipping has increased as respective measurements have been made publicly available (for discussion see Section 2.3.4). The current state and future prospects of raising quality in the Baltic shipping pose a number of questions, including which mechanisms are behind the quality governance and how coordination problems in extra-territorial and cross-jurisdictional shipping governance have been resolved. Though actors in Baltic maritime transport were capable of avoiding some of the environmental bads, and to a certain extent ensured the collective goods, this does not mean that (1) risks posed by intensive shipping are irrelevant (but presumably minimized), and (2) issues critical to ensuring quality shipping are resolved (e.g., impact of the safety culture). That is why this research also asks what could be done to bring more quality into Baltic shipping. It aspires to pose further questions about the governance of such an ephemeral thing as 'quality' and what it then means to promote quality in shipping. Finally, it highlights the specific conditions for solving environmental problems in Baltic shipping, which at the same time can be considered as an 'easy' case for collective action, due to the significant amount of regional institutions for cooperation in place, but also a 'hard' one, due to highly divergent interests and agendas of the participating actors.

1.4 Reflections on non-epistemic values and cognitive practices

The discussion of non-epistemic values and the impact of cognitive biases stemming from researcher's positionality is a part of good practices in the social sciences. The methodological position of this research is informed by critical realist ontology and epistemology that recognize inevitable bias of scientific knowledge production, rejecting the idea of value- and ideology-free science (see discussion in Section 4.1). Although reflexivity about one's own

position might not be capable of preventing bias in research, it can at least indicate from which directions biases can come. Therefore, it is critical to integrate the reservation regarding what this research can and cannot do directly from the beginning.

In this research there are several issues that can potentially influence the results of the investigation. Firstly, I must note my training – which was acquired in three different countries (Russia, Germany, and Finland) that have distinct traditions in social research – which has influenced my skills and preferences as a researcher. Additionally I have never had any specialized training in maritime or naval affairs or engineering, whereas the subject of my research is technical in many instances. As relevant knowledge was acquired simultaneously with the writing of this dissertation, biases may stem from misinterpretations or misunderstandings of technical issues. Secondly, linguistic skills influence research processes in many ways, including access to data (I mostly used English and Russian language sources, though Finnish and German language sources were also sometimes included) and interpretation (at times meanings may be elusive or 'lost' in translation). Thirdly, since throughout the research process I mainly received feed-back from specialists in Baltic Sea region and Russian studies and developed my thesis on that basis, some turns and directions in interpretation and argumentation were influenced by this research tradition. Finally, publishing individual studies in peer-reviewed journals had an impact on their form, structure, and framing. Since I had to adhere to the journals' standards, including length limits, not all topics could have been covered. At the same time, some arguments were formed in a way that emphasized interaction with general discussion upheld in the journal. Eventually, reviewers' comments constituted an important way of re-thinking and re-framing my research. I am grateful for this process, but surely the outcomes differ somewhat in comparison to a monograph, which would have been written with less interaction with scholarly community.

Another potential source of biases are choices made while pursuing the empirical research, which was conducted without a strict preliminary plan and turned out to be an engaging and challenging journey. Some choices were made based on theoretical and methodological reasons, some were dictated by practical considerations, but some choices were also made on account of research intuition. Being fully aware of my subjective responsibility for the choice of topics, data collection and analysis process, I see this research as a mirror of my scientific development from a master's student drafting a dissertation proposal to a doctoral candidate in front of dissertation defense. Over the course of this development, the concepts have changed to better reflect the essence of matters under scrutiny. The initial impulse for writing this dissertation came from the objective in the EU Baltic Sea Region Strategy 'to make the Baltic Sea region a model region for clean shipping', which provoked my lively interest in respect to how clean shipping can actually be realized. Due to this legacy, in the first years of research I tended to use the concept of 'clean shipping' and 'clean shipping governance' (Articles I-III), realizing the potential shortcoming of this term at a later stage and substituting it by 'quality shipping' and 'quality shipping governance' as a more generic term (see also Sections 3.2 and 5). Since individual studies are published and cannot be re-written (though today I would design and pursue them differently), I accept all of them as a path that led to the completion of this research project. Yet, I see my task in

explaining choices made in this research in a coherent and transparent manner in order to show how they account for the findings presented in this dissertation.

BACKGROUND

2.1 Why contextualizing? Establishing the research setting

All events occur in time and space, meaning that a study of social activities among individuals and groups and processes cannot be disconnected from their spatial location and temporality. Therefore, understanding actors and interactions both among themselves and with institutions is to a large extent a matter of understanding their embeddedness into natural, politico-administrative, economic, functional, and other contexts. Context can be understood as a background, encompassing everything that surrounds actors and their interactions, however distinct from them. This approach to contextual variables is close to the social-ecological systems (SES) framework developed by Ostrom (2009), as it pursues the same goal of understanding how features related to social and ecological contexts affect actors' capacity to address and resolve collective action problems. A systematic observation of the contexts can explain what mechanisms and processes can be considered significant for the institutionalization of new practices (Tilly, 2006, p.420) as well as what contexts may define which actors will be involved into an interaction (Torfing et al., 2012, p.87). To understand how the real politics are made, the analyses of actors, institutions, and governance shall be inclusive, historical, and qualitative, and therefore uncover the context, and not assume that social interaction happen in an airless space (Thelen, 1999).

In social sciences the notion of 'region' is often used to define a specific context of social interaction. This dissertation also concentrates its scope of investigation upon the Baltic Sea region, which is geographically defined as the Baltic Sea and adjacent coastal territories (a more detailed description of different facets of the BSR can be found in Section 2.3). The Baltic Sea as a context for quality shipping governance needs to be taken into account when analyzing the present state of shipping. Natural conditions have the potential to influence transportation activities by putting limitations upon a vessel's size, technical equipment, choice of routes etc. The state of the markets influence the structure of trade, type of shipping, conditions, infrastructure, and services in ports. Political processes and power struggles have the potential to modify the relationship between on shore and offshore activities both within the environmental policy agenda and within the global value-chains. Availability of certain technologies, the presence of regional regulatory standards (e.g., designation of particularly sensitive sea area (PSSA), emissions control area (ECA)), local social and environmental activism, all have an impact upon how maritime transportation activities are being performed and which tools are available for governance of shipping externalities.

Pollution from shipping and governance of shipping quality are also contextually defined. Shipping is embedded within multiple contexts created by respective natural, politico-administrative and functional areas and processes that change over space and time (circumventing a detailed discussion on the origin and use of the term, for the purpose of this research 'area' is understood broadly as a site or scene of an event, or as a fact of having a location in space). Context for governance of shipping quality is shaped by several dimensions, including (1) physical areas that can be measured with geographical coordinates (e.g., the Baltic Sea, the port of Primorsk, Helsinki Convention scope of application); (2)

functional areas that have a more fluid positioning in space, but are defined by encompassing certain activities (e.g., shipping, energy supply chain, logistics); and (3) institutional dimension, primarily composed of politico-administrative and economic institutions, which are denoted by similarity of practices and values attached to certain types of activities (e.g., Nordic corporatism, Russian "power vertical", corporate social responsibility (CSR), shipping safety culture). Additionally, contexts encompass a temporal dimension, which can be seen as a dynamic within these areas. Yet, the relationship between the subject of the study (governance of shipping quality) and its multiple contexts is of mutual influence and interdependence. The instruments of governance are not simply context-driven mechanisms, but also context-shaping choices with a potential to actively transform and re-shape their institutional environment (Lascoumes and Le Galès, 2007).

One further issue to take a note of when defining the ontological properties of the context is the actor-network theory (ANT) developed by Latour (1993). For ANT, which recognizes nonhuman objects (e.g., infrastructure) as an actor in social interaction, the division between 'human society' and 'natural environment' is superficial. Other theorists of ANT (most prominently, M. Callon, J. Law, A. Mol) also support the idea that in order to explain social process, research needs to understand and show how actors become interconnected or how they fall apart, where an actor is anything that acts or to which activity is granted by others and links/bonds between actors are contexts that have to be included into investigation of networks, which are in turn assemblages of actors (Dolwick, 2009, p.39). Thus, ANT theorists do not divide social reality into 'subjects' and 'objects', but recognize networks between humans and non-humans. This approach suggests studying relations between a set of actors and including context as a part of this relationship, and not as a background in which these relations are taking place. In Latour's interpretation "context never really exists because it is always 'instantiated' through individual practice" (2005, p.170). The 'more-than-human' ontology of ANT has been i.a., criticized for the fact that nonhuman objects have no intentionality, therefore, cannot really act, enter an interaction, or purposefully communicate or pursue their interests. A further critique of ANT research is its complexity, which can easily turn into arbitrariness: since actors can be anything and social reality is full of 'everything', a researcher applying ANT needs to make subjective choices which actors are to be included in a network, an overwhelming task which may be seen as creating partial discretionary narratives. At the same time, ANT teaches us a useful lesson of paying attention to spatiality and materiality when doing research. In this research, the distinction between actors and contexts is made on the basis of intentionality. Nevertheless, contexts in which interactions take place are not treated as a homogeneous background. Attention is paid to how context – with its peculiar traits obtained through presence of certain nonhuman objects – potentially shapes actors' rational intentions. Even if difficult to demonstrate, contexts shall be kept in mind as a 'latent' factor and not a black box that cannot be unpacked.

2.2 Shipping and the environment

2.2.1 Emissions and discharges from shipping

Maritime transport is a source of a wide range of polluting emissions and discharges produced in the process of shipping operations, which includes cargo loading/unloading, docking, maneuvering, piloting, bunkering, and navigation. Emissions and discharges from vessels' operations can broadly be divided into five groups: (1) emissions into air (e.g., sulphur dioxide (SO_x), nitrogen oxides (NO_x), particulate matter (PM), ozone-depleting substances (ODS), volatile organic compound (VOC), greenhouse gas (GHG)), (2) discharges into water (e.g., waste from machinery and auxiliary systems operation including engine room waste and slops, bilge waters, bunker and cargo oil spills, sewage, garbage, liquid and solid waste produced on board, lost cargo), (3) discharges onto shores (garbage and ship waste, sewage, oil-contaminated waste), (4) introduction of alien species, and (5) noise and vibration. In respect to their origins, oil spills and cargo losses tend to be more often associated with accidental pollution, whereas air emissions, garbage, sewage, waste and bilge waters, alien species, noise and vibration more typically stem from routine shipping operations (Srivastava, 1989; Smith, 1995; Matthias et al., 2010; Ng and Song, 2010).

Among various instances of vessel-induced pollution in this dissertation, air and oil pollution are dealt with in more detail and investigated in the case-studies (Articles III and IV). The reasons for concentrating on these prominent cases are twofold. Firstly, the adverse effects of air and oil pollution are recognized among industry stakeholders and are rather well known among non-specialists and the wider public. Secondly, unlike other types of pollution, e.g., alien species or underwater noise, in which measures have just recently entered into force or are pending entry into force, these are relatively old areas in which regulation is in place for a longer time, enabling the tracing of governance mechanisms development. Finally, in both areas attempts to govern are a mix of intergovernmental regulation and private efforts from within the maritime industry, which allows for applying a uniform theoretical framework.

The fact that oil spills constitute a significant environmental risk has been recognized earlier than other environmental issues associated with maritime transport. Firstly tankers started to operate already in the 19th century and by the 1950s tankers grew in size up to 100,000 tons DWT reaching an unprecedented size of 500,000 tons DWT in the 2000s. Being the main source of energy, oil is transported in increasing quantities and to a large extent by sea (Lun et al., 2013). Intensification of oil carriage by sea has resulted in an increase of the number of accidents, increase in size of tankers, and an increase in the size of spills. Apart from accidents, oil pollution can result from routine tanker operations (e.g., release of oily ballast water, which has become less usual with introduction of separation between cargo and ballast tanks since adoption of the Protocol of 1978 to the International Convention for the Prevention of Pollution From Ships (MARPOL Convention) where Regulations 13(9) and (10) of Annex 1 required dedicated clean ballast tanks), as well as from discharges produced by non-tankers in the case of oily bilge water, deballasting fuel tankers and accidents (M'Gonigle and Zacher, 1981, pp.16-17, 22-23). The introduction of oil into the sea has devastating effects for marine ecosystem as crude oil and its products are toxic to marine life,

causing diseases, abnormal reproductive cycles, and even extinction, and their components stay in the sediment for extended periods (Blumer, 1971; Atlas and Bartha, 1973; Mitchell, 1994).

The realization of the contribution of shipping to local atmospheric problems – as well as to global environmental issues such as climate change – as a result of emissions and discharges into air has significantly grown during the past decade (Jalkanen et al., 2009; Psaraftis and Kontovas, 2009; Asariotis and Benamara, 2012). Smog-forming nitrogen oxides, sulphur dioxide, which forms harmful fine particles and falls back to earth as acid rain, and particulate matter causing respiratory problems and thousands of premature deaths every year (Corbett et al., 2007), respiratory, allergic, and immune effects associated with man-made volatile organic compounds, constitute only a part of a list of harmful impacts of shipping emissions. Large diesel engines of the sea-vessels are responsible for 3% to 4.5% (according to different estimations) of the overall CO_2 pollution. Technically, air pollution from shipping can be further reduced through engine optimization, hull and propeller modernization, slow steaming, as well as switch from the old-fashioned engines fuelled by heavy fuel oil (HFO) to those powered by marine gas or diesel oil (MGO/MDO), liquefied natural gas (LNG), hydrogen and other alternative fuels, or even by wind and wave powers.

Water as a ballast has become common in shipping, starting with a proliferation of steel hull technology more than hundred years ago, however, the problem of invasive species in ships' ballast water appeared on the agenda of international maritime community only in the 1980s. Ballast water discharges usually contain a variety of biological material, including non-native (alien) species that can cause environmental and economic damage by disrupting aquatic ecosystems, thereby posing hazards to native species, human health, and commercial activities such as fisheries and aquaculture (Leppäkoski et al., 2002; Endresen et al., 2004). The global scope of the problem prompted the International Maritime Organization (IMO) to adopt the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) in 2004, requiring ships to develop specified BWM plans. However, the BWM Convention has not yet entered into force as a sufficient representation of world merchant shipping tonnage has not yet been achieved. The awareness of the effects of noise and vibration produced by seagoing vessels is also relatively new to the wider public (though common to mariners and inhabitants of areas adjacent to ports) and attempts to mitigate these effects, including shore-side energy supply for vessels in ports, are undertaken (McCarthy, 2004; Ross, 2005).

To sum up: today knowledge of negative environmental impacts from shipping is well-established and seldom contested, and this is putting shipping under increasing pressure to become more environmentally-friendly. Wide recognition of the negative effects of vessel-induced pollution on ecosystems, human health, and commercial activities brought it into the realm of public regulation, but maritime governance is marked by a substantial number of private regulatory arrangements and voluntary schemes alike. In what follows a brief sketch on the maritime governance 'mix' is provided. In particular, attention is paid to the instruments addressing oil and air pollution, as those constitute the subject-matter of the individual studies featuring this dissertation.

2.2.2 Public regulation of emissions and discharges from shipping

Given the negative environmental impacts, a complex architecture of international, regional, and national agreements was set up to protect global oceans from the introduction of pollutants, and species inhabiting its waters from disturbances. Its cornerstones are the United Nations Convention on the Law of the Sea (UNCLOS 1982) and the International Convention for the Prevention of Marine Pollution from Ships (MARPOL 1973/1978). Additionally, there are specified legal instruments for different types of pollution on the international, regional, and national levels, which include both framework instruments on marine environment protection and concrete provisions setting emission standards, prohibiting certain operations, or providing penalties in the event of polluting discharges.

International regulation of vessel-based oil spills is most comprehensive, tight, and restrictive when compared to the regulation of other types of pollutants. Due to the significance and scale of environmental consequences associated with accidental oil pollution, tanker accidents happened to become a legislative driver for a number of international maritime conventions. MARPOL Convention and the International Convention on Civil Liability for Oil Pollution Damage (CLC 1969), are often considered to have been initiated due to the *Torrey Canyon* accident in 1967. The *Exxon Valdez* accident in 1989 prompted the US Oil Pollution Act (1990), the International Convention on Oil Pollution Preparedness, Response and Co-Operation (OPRC 1990), and amendments to MARPOL regarding the phase-out of single-hull tankers: The sinking of *Erika* in 1999 set off the EU legislative process, resulted in so-called Erika Packages, and already mentioned Prestige spill in 2002 accelerated phase-out of single-hull tankers in European waters. The CLC 1969 introduced liability for damage from oil pollution resulting from tanker accidents, placing responsibility upon the owners of the ship, who can limit their liability in accordance with established procedures. The Protocol of 1992 to CLC 1969 changed compensation limits, widened the scope to cover exclusive economic zones (EEZ), and established higher limits of liability. In order to cover oil pollution that does not result from tanker casualties, the International Convention on Civil Liability for Bunker Oil Pollution Damage as an instrument analogous to CLC 1969 was adopted in 2001 (and entered into force 2008).

Air emissions and discharges from shipping have become a subject to global public regulation with the adoption of amendments to MARPOL Convention in 1997 when a new Annex VI, which entered into force on 19 May 2005, was added. The 2008 revision of the MARPOL Convention incorporated measures for the progressive reduction of SO_x, NO_x and PM emissions. As a part of progressive emission reduction policy of the revised MARPOL Annex VI, an instrument of emission control areas was introduced. For the time being, four areas have been designated as ECAs. Among them the Baltic Sea has become an SO_x control area, which effectively means that the maximum sulphur content of the fuel oils loaded, bunkered, and used on board vessels in these areas should currently not exceed 1.00% m/m and shall be further reduced by 0.10% m/m after 1 January 2015, a very ambitious target in comparison to the 3.50% global cap applicable worldwide (at least until 2020). In order to meet the upcoming ECA requirements several options have been proposed: (a) use of low-sulphur fuel (MGO/MDO), (b) use of exhaust gas cleaning systems (scrubber), (c) use of

LNG as a fuel, (d) use of other alternative marine fuels (Kalli et al., 2009; Bengtson et al., 2011; Acciaro, 2014).

Consequently, ECAs will also feature more stringent standards for NO_x emissions. The MARPOL Annex VI NO_x reduction scheme foresees three different levels of control (so-called tiers), which are applied based on the ship construction date. Whereas Tier II is applied to all vessels constructed after 1.1.2011, the Tier III limits adopted in 2008 were to be applicable to ships built from 2016 and sailing in ECAs. In 2013 IMO decided to postpone the entry into force of the Tier III NO_x emissions limits for ship engines from 2016 to 2021. In addition to limitation of SO_x and NO_x emissions, GHG emissions are addressed by the MARPOL Annex VI. Chapter 4 of MARPOL Annex VI introduced two mechanisms to ensure an energy-efficiency standard for ships: (1) the Energy Efficiency Design Index (EEDI), for new ships, and (2) the Ship Energy Efficiency Management Plan (SEEMP) for all ships, applicable to all ships of 400 gross tonnage from 1.1.2013. The EEDI is a mandatory tool to improve the energy efficiency of vessels and thereby reduce their CO_2 emissions. The idea of this design index is to provide a measure of how much CO_2 is produced per amount of transportation performed with a final goal of optimizing marine engines. The SEEMP, instead, includes a number of measures that can allow ships to improve their performance in terms of CO_2 emissions, such as raise the efficiency of fuel operations, optimize ship handling, hull, propulsion, machinery and equipment, handling of cargo, as well as prevent energy losses and increase energy conservation through raising awareness. Slow steaming and shore-side power supply are among the prominent measures that received wide reception among shipping companies. Altogether, changes introduced by MARPOL Annex VI have created much interest in alternative marine fuels as a way to mitigate the regulatory challenges and balance commercial profitability and environmental responsibility (Johansson et al. 2013).

2.2.3 Other measures addressing emissions and discharges from shipping

Whereas the overall structure of managing adverse environmental effects of shipping is defined by international intergovernmental arrangements, regional and private governance measures should be mentioned, too. Maritime transportation has often been portrayed as a globalized industry that requires global governance (Zacher, 1999; Sletmo, 2001). At the same time, the IMO and its system of global conventions has been blamed for being too slow (ratification and entry into force can take several decades!) and producing 'minimum common denominator' outcomes (Roe, 2012, p.154). Even when new rules are adopted, significant variation in the willingness and ability of individual states to enforce the IMO regulations has been identified (Alderton and Wichester, 2002; Bloor and Sampson, 2007). At the same time, certain regions and even single industry actors wanted to proceed in improving the environmental performance of maritime transport on their own schedule, being ahead of global regulation to both anticipate the upcoming challenges and gain a positive reputation (Yliskylä-Peuralahti and Gritsenko, 2014). Self-regulatory measures were developed by the shipping industry actors in cooperation with each other, as well as in collaboration with public sector and non-governmental organizations specific to types of shipping, geographical regions, and otherwise organized clubs marked by certified quality (DeSombre, 2009).

Apart from above-mentioned ECAs, the IMO foresees the ascribing of a status of particularly sensitive sea area (PSSA) to certain areas. In practical terms, a PSSA gives a possibility to introduce associated protective measures (APMs) to be implemented jointly under the PSSA umbrella. APMs include specific ways of controlling the maritime activities in the PSSA, such as routing measures, discharge, and equipment requirements for ships. The Baltic Sea was granted PSSA status in 2005. In addition to local instruments developed under the auspices of global organizations, genuinely regional instruments play no less important a role in specifying the shipping governance structure in terms of mechanisms, instruments, and implementation entities. The Baltic Sea Helsinki Convention 1992 governed by Helsinki Commission (HELCOM) is a special instrument developed in the Baltic Sea region that aims at improvement of the status of the Baltic Sea, i.a., addressing emissions and discharges from maritime transport. Some of the provisions of Helsinki Convention go beyond global regulation, for example, it has taken a progressive stance in matters of ballast water treatment and introduced a no-special-fee system for port reception facilities (PRF) in order to address the problems of sewage and garbage pollution.

Collective action by maritime industry actors aimed at increasing quality standards is nothing new to shipping. On the contrary, the maritime sector developed a number of private rules systems, such as marine insurance (an institution developed already in 17th century, on the history of Lloyd's coffee shop and marine insurance see Kingston, 2007), vessel vetting, and a vessel classification system of open registration. Multiple actors, embracing both public and private bodies, were involved in increasing safety and reducing the adverse effects of shipping: prominently classification societies (joined in the International Association of Classification Societies, IACS), P&I clubs, ship owner associations (such as INTERTANKO and INTERCARGO), and industry associations (such as the Oil Companies International Marine Forum, OCIMF). With time, new regulators in the form of private certification schemes have appeared: Green Ship Award, which aims to improve the safety and environmental performance of oil, chemical, and bulk carriers, the Clean Cargo working group, which is a global initiative to improve the environmental performance of container transport, especially regarding GHG emissions, the Clean Shipping Index (CSI) developed by the Clean Shipping Project, RightShip certification scheme formed to improve dry bulk safety and quality standards, the Blue Angel scheme for environmental-friendly ships to minimize emissions into atmosphere and water and others seeking to initiate voluntary action among ship owners and provide incentives to move shipping quality standards upwards[1].

2.3 Commercial shipping in the Baltic Sea

2.3.1 Baltic maritime transport patterns

Maritime transport forms a specific functional area in the BSR, as through it shipping cargo and passenger flows are administered and channeled. The significant amount of intra-regional maritime trade and transshipment makes the Baltic Sea region a well-developed transport market representing about 7.5% of the world's maritime transport (Jenisch, 2002, p.69; Figure

[1] Information on private certification schemes is based on publicly available sources and www-pages, it can be inferred from the reference list.

1). The Baltic Sea has some of the busiest shipping routes in the world with an average of 2000 vessels at sea at any time (HELCOM Maritime). The Baltic Sea 2020 Foundation estimated that the maritime transport will double by 2017, whereas shipment of oil and energy commodities can grow by up to 40% (Baltic Sea 2020).

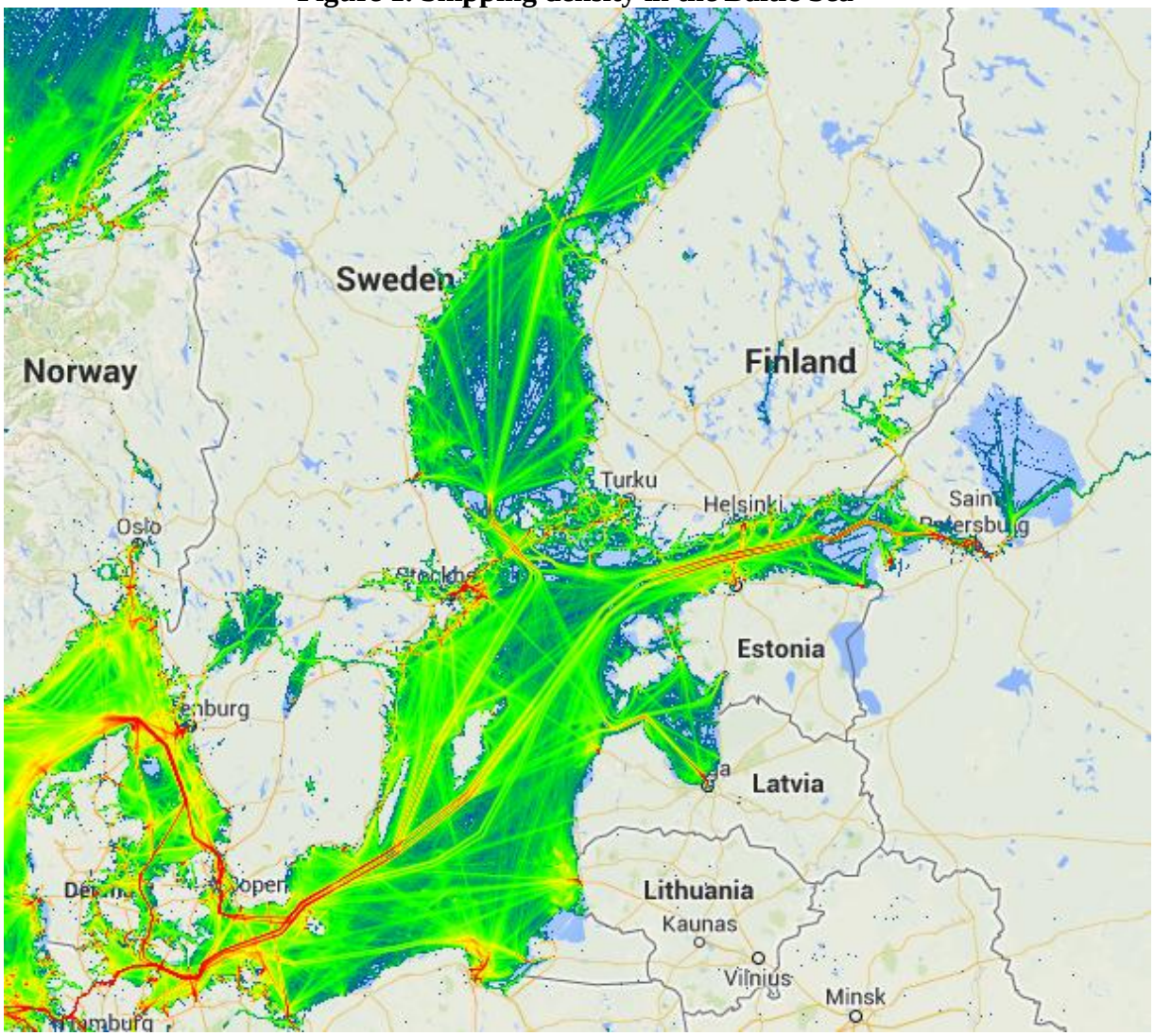
The main trends that can be identified in Baltic maritime transportation over the past decade are:

(1) intensification of shipping (more ships navigating in the Baltic Sea, Figure 2 and more cargo moved in total, Figure 3);

(2) change of structure in transported goods (stable increase of liquid bulk, mostly related to an increase in the amount of shipment of oil and oil products, chemicals, and liquid gas, Figure 4);

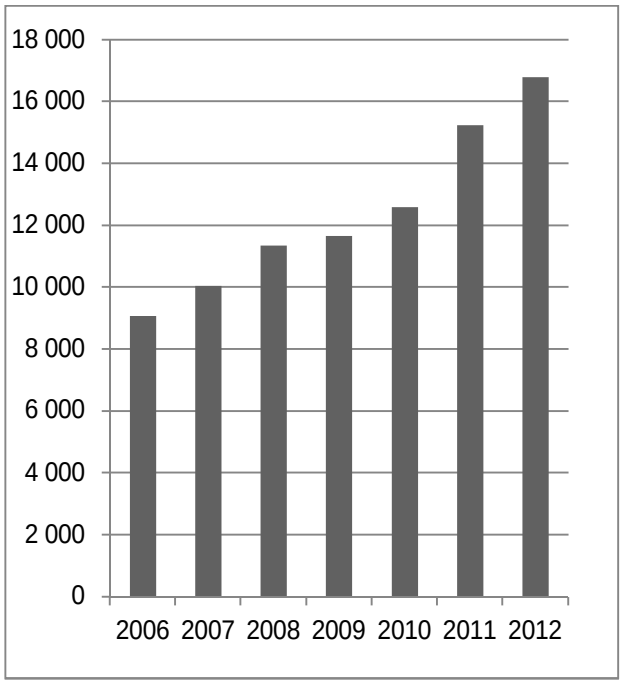
(3) change in ports throughput (including development of new terminals and specialized oil ports, such as Ust Luga and Primorsk, Table 1).

Figure 1. Shipping density in the Baltic Sea



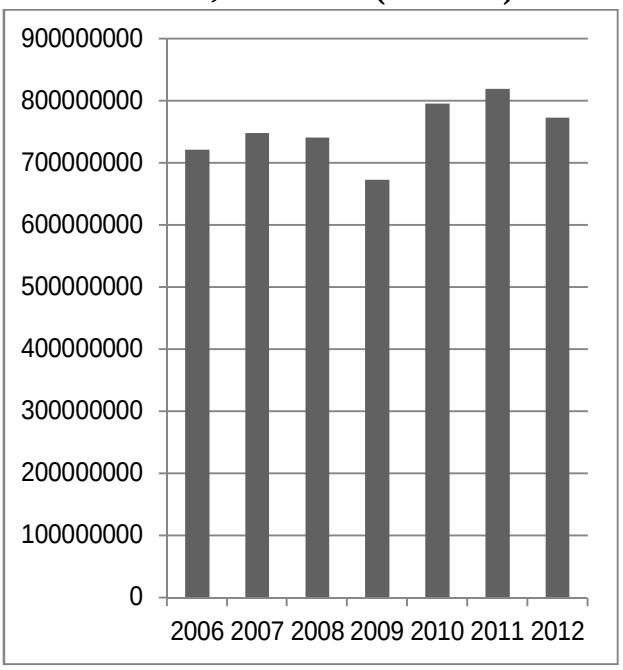
Source: Historical density map based on terrestrial and satellite AIS signals. MarineTraffic.com

Figure 2. Number of ships in the Baltic Sea, 2006-2012



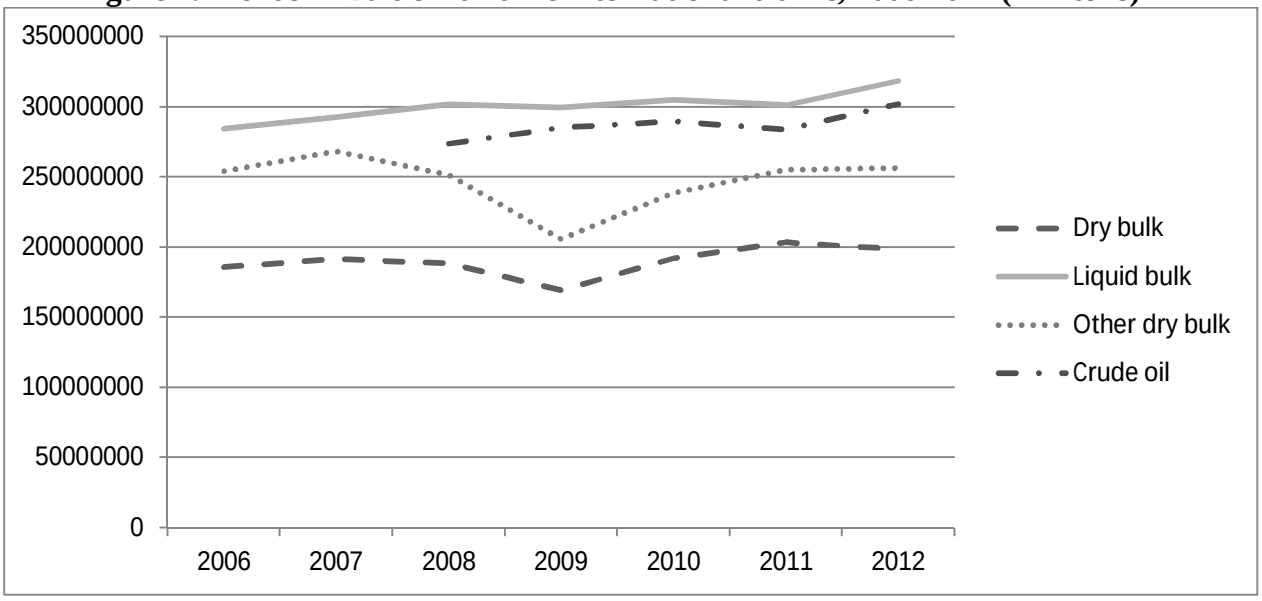
Source: Jalkanen and Johansson (2012). NOTE: The number of ships is reported on the basis of AIS data.

Figure 3. International cargo traffic in the Baltic Sea, 2006-2012 (mln tons)



Source: University of Turku, Center for Maritime Studies. NOTE: reported volumes are based on port data.

Figure 4. Trends in Baltic maritime international traffic, 2006-2012 (mln tons)



Source: University of Turku, Center for Maritime Studies. NOTE: reported volumes are based on port data. Crude oil data available only for 2008 - 2012.

Table 1. Top 20 Baltic ports by volume, 2006 and 2012 (mln tons)

	2006		International trade (imp + exp), mln tons	2012		International trade (imp + exp), mln tons
1	Primorsk	RU[2]	65956300	Primorsk	RU	74769000
2	St. Petersburg	RU	54068200	St. Petersburg	RU	57484000
3	Tallinn (Muuga, Old City, Paldiski, Saaremaa)	EST	41083000	Ust-Luga	RU	46844800
4	Gothenburg (Göteborg)	SE	37036000	Gothenburg (Göteborg)	SE	38739000
5	Ventspils	LV	29062000	Riga	LV	36052000
6	Riga	LV	25357600	Klaipeda	LT	35242678
7	Gdansk	PL	23758700	Ventspils	LV	30346000
8	Klaipeda	LT	23611200	Gdansk	PL	23757460
9	Luebeck	DE	21039010	Muuga	EST	21453000
10	Rostock	DE	18314543	Kilpilahti/Sköldvik	FI	19178000
11	Kilpilahti/Sköldvik	FI	16081077	Brofjorden Preemraff		18770000
12	Brofjorden Preemraff		15866000	Luebeck	DE	17106000
13	Kaliningrad	RU	14943200	Rostock	DE	16290000
14	Gdynia	PL	14104700	Vysotsk	RU	13523000
15	Fredericia	DK	13321000	HaminaKotka	FI	12981000
16	Vysotsk	RU	13258800	Gdynia	PL	12961000
17	Helsinki	FI	11363296	Kaliningrad	RU	11665500
18	Trelleborg	SE	11320000	Swinoujscie	PL	11160000
19	Szczecin	PL	9626100	Helsinki	FI	10688000
20	Kotka	FI	9263296	Trelleborg	SE	10183000

Source: Baltic Port List, University of Turku, Center for Maritime Studies.

These changes are related to the development of the Baltic Sea as a major energy transport route. The motivations for increased use of sea routes for the transportation of oil from Russia to the main European consumers were due to geopolitical shifts in the region (a more detailed discussion is provided in Article IV). As the amount of shipment of oil and oil products has gradually increased, vessel traffic on a relatively small Baltic basin has grown proportionately, which has raised the risk of accidents and, as a consequence, damage from discharges, emissions, and other types of pollution. The growing intensity of sea traffic also leads to an increase in air emissions, which was identified and addressed by introducing special limits on air pollutants emitted from ships when the Baltic ECA was established. Both traffic in general, and oil transport in particular, are expected to grow further during the forthcoming years (Brunila and Storgård, 2012).

2.3.2 Baltic natural context and shipping

This intensified transport is taking place on the Baltic Sea, a relatively small sea area (ca. 370,000 km²), which covers the Gulf of Riga, the Gulf of Finland, the Gulf of Bothnia, the Baltic proper, and the Belt Sea. The water in the sea is brackish with species adapted to living

[2] Country codes as follows: DK – Denmark, EST – Estonia, FI – Finland, DE – Germany, LV – Latvia, LT – Lithuania, PL – Poland, RU – Russia, SE – Sweden.

in low salinity and the Danish Straits enable the only connection with the open seas, thus, slowing down water exchange. This narrow connection hinders the water exchange so if harmful substances are introduced they will remain for a very long time. The catchment area of the Baltic Sea is almost four times larger than the sea, with roughly a half of lands forested, twenty percent used for agriculture, rest of mixed use and wetlands (HELCOM, The Baltic). The territories adjacent to the sea are densely populated, with about 85 million people living in the catchment area and 15 million in a direct proximity to the coast (within 10km) (BALTEX, 2007). The majority of all polluting substances introduced into the Baltic Sea come from land-based activities, including agricultural run-off, sewage, industrial and municipal wastewaters (HELCOM Land). The most significant problem arising from the nutrient inputs is eutrophication (HELCOM, 2009). As a result, the Baltic Sea is still considered to be one the of most polluted sea areas in the world.

The natural conditions of the Baltic Sea set limitations on maritime navigation. The sea area is shallow (average depth 57m), it features unique archipelago areas and the seabed is rocky especially in the northern part of the sea, which poses a risk for vessel collisions and groundings, reducing navigation to specific fairways. In winter the sea is largely covered by ice, which requires special vessels and navigational skills, as well as icebreaking, piloting, and tugging services. Low salinity, the large number of islands, long periods of ice cover, the shallowness of the sea and long coastline make the Baltic ecosystems vulnerable to stress caused by introduction of polluting substances and make cleaning operations particularly difficult (WWF, 2003; Lindén et al., 2006). The special natural characteristics and the deteriorating environmental condition of the Baltic Sea have created much concern and provoked a wide discussion of the current state and future prospects of raising quality in the Baltic shipping.

2.3.3 Baltic institutional context and shipping

The Baltic Sea region as a politico-administrative area includes littoral countries, regional and local administrative units, as well as a bright palette of regional intergovernmental, transnational, and non-governmental organizations. There are nine countries that border the Baltic Sea directly (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden) and five more countries constitute its catchment area (Belarus, The Czech Republic, Norway, Slovakia, and Ukraine). The Baltic Sea region is densely populated with regional intergovernmental and transnational organizations (Kern, 2011). There are several dozen different networks, policy and activist organizations, think-tanks, research and lobby institutions that work on environmental, safety, educational, economic, transport, labor, culture, tourism, and other civic issues (NORDREGIO, 2009). Many of those organizations work on the same themes, although from different perspectives and at different levels.

Helsinki Commission (HELCOM) is one of the oldest and most significant organizations in the BSR, and is directly involved into governance of shipping. HELCOM's thematic working groups collect and integrate data from around the Baltic Sea, providing expertise in regional environmental affairs, creating platform for meetings and communication, and enabling cooperation beyond the EU scope, which is important for

maintaining relations with stakeholders from Russia. HELCOM's maritime objectives include (1) Enforcement of international regulations – no illegal discharges; (2) Safe maritime traffic without accidental pollution; (3) Efficient emergency and response capabilities; (4) Minimum sewage pollution from ships; (5) No introduction of alien species from ships; (6) Minimum air pollution from ships; (7) Zero discharges from offshore platforms; (8) Minimum threats from offshore installations (HELCOM Maritime). HELCOM is a unique source of integrated, comparable information on shipping accidents, vessel-induced pollution, illegal discharges and similar matters, to which open access is enabled. Though HELCOM is an intergovernmental body that does not have law-making power, its recommendations are influential. HELCOM's Baltic Sea Action Plan (BSAP) has become a guidebook for environmental cooperation in the BSR.

Among the Baltic littoral states, eight belong to the European Union (after the 2005 enlargement) and the EU has been active in developing its policies and proliferating governance structures for the BSR. The EU Commission is a party to the Helsinki Convention and a member of the Council of The Baltic Sea States (CBSS, which consists of the Ministers for Foreign Affairs from each member state and a member of the European Commission). By these means, the EU has established its independent position in the largest regional governance structures. Among the most significant instruments deployed by the EU to create linkages between its own supranational structures and the regional and sub-regional actors and institutions are European funding schemes (the Structural and the Cohesion Funds), cross-border cooperation programs (the Baltic Sea Region Programme within the INTERREG framework, and the Northern Dimension), and the EU Baltic Sea Region Strategy (BSRS). The EU BSRS has become the first designated EU regional strategy aiming at improving regional competitiveness and strengthening regional governance by joining resources in collaborative action. The EU BSRS also features a maritime dimension; among its goals is to make the BSR a model region for clean shipping.

In addition to international public actors and national maritime administrations, shipping involves dozens of private parties (shipping companies, ports, brokers, insurers, classification societies, cargo owners) and non-for-profit organizations and industry associations (e.g., ship owners, port organizations), which all contribute to establishing, negotiating, applying, and changing rules and norms that constitute the institutional context in which Baltic shipping takes place. The existence of multiple actors involved at different stages of maritime operations makes the structure of shipping industry polycentric and multileveled. The nexus between the politico-administrative complexity of the Baltic Sea region and functional complexity of the shipping industry highlights the need for context-sensitive inquiry.

2.3.4 Environmental impact of shipping in the BSR

Whereas adverse environmental impacts of shipping activities are widely acknowledged and the sources of vessels-based pollution were put under scientific scrutiny, in terms of actual numbers our knowledge about connections between global shipping and the environment is relatively scattered and partial (IMO, 2012). The situation is different in the Baltic Sea region,

where the pioneering efforts of the Helsinki Commission to organize collection and analysis of data allowed establishing a relatively robust picture regarding the shipping environmental and safety performance. In particular, HELCOM has focused on the following indicators: illegal oil discharges (available from 1988), comprehensive air emissions inventories (2006 onwards), and safety reports (detailed statistics on accidents number, place, causes, types, and results available from 2002). Statistics on shipping environmental impact has been made available publicly via the Internet.

Despite rapidly growing density of shipping, a decreasing trend can be observed in regard to illegal oil discharges (HELCOM Response, 2013). Altogether 139 oil spills were recorded in 2012, which is an obvious decrease in comparison to the average of ca. 400 in the beginning of the 2000s (Table 2). Most spills recorded are of small scale, the majority of spills are smaller than one cubic meter and less than 100 liters. Breakdown for quantities into categories for each year can be found from the HELCOM Response fact sheets. This development is associated with increased frequency of the surveillance flights and improved usage of remote sensing equipment (HELCOM Response, 2013). Apart from surveillance, the decreasing trend can also be attributed to a complex Baltic Strategy to prevent illegal discharges of oil and waste into the sea, which included a 'no-special-fee' system for using port reception facilities, where adequate treatment of waste is provided (The Baltic Sea Portal, 2009). The significant renewal rates of the Baltic fleet could have also had an impact as newer vessels are equipped with systems capable of treating wasteful products on board or retaining them safely until they are discharged to PRFs.

Whereas until 2007 air emissions from shipping were increasing, starting from 2007 in all subsequent years emissions of major pollutants (SO_x and PM) from Baltic shipping have gradually decreased (Table 3). This trend is associated with the entrance into force of the Baltic Sea SECA (SOx Emission Control Area) during 2006 and the reviewed EU directive 2005/33/EC (the so-called "sulphur directive"), which starting from year 2010 prescribed all ships to switch to less than 0.1 sulphur content fuel in ports if their hoteling period is longer than two hours (Jalkanen and Johansson, 2013). It is important to note, that during the whole time that the intensification of shipping was registered (Figure 1, Section 2.3.1), indicating both relative and absolute decrease of emissions due to the use of innovative technology (such as alternative marine fuels, shore-side electricity, fuel-saving measures, slow-steaming) and/or improvements in regulatory compliance.

Additionally, the situation in waste and sewage treatment has improved in the past ten years. In 2007 HELCOM decided to propose at IMO to create a special area under MARPOL Annex IV in the Baltic Sea and improve port reception facilities, submitting a joint proposal in December 2009 (HELCOM, 2010a). In July 2011 the IMO approved amendments to MARPOL Annex IV, which introduced the Baltic Sea as a special area under Annex IV and added new discharge requirements for passenger ships while in a special area. The special area status entered into force on 1.1.2013, and from that date onwards discharge of sewage into the sea from passenger ships is prohibited (unless an on board sewage treatment plant is used), and all untreated sewage is to be delivered to an onshore PRF. At the same time, starting from 2010 a HELCOM roadmap for upgrading the availability of port reception

facilities for sewage in major passenger port was put into action. The cooperation on PRF under HELCOM encouraged shipping companies and ports to undertake voluntary activities and to dispose sewage to PRF, with the largest passenger ports in Stockholm, St. Petersburg and Helsinki setting an example. In regard to ballast waters treatment, regulatory action has been undertaken, but due to "the lack of data on the presence and distribution of harmful species in Baltic Sea ports and their vicinity, i.e., where ballast water operations occur" the effectiveness of these regulation and measures undertaken remain difficult to assess (David et al., 2013, p. 207).

Table 2. Illegal oil discharges and aerial surveillance in the Baltic Sea

Year	Total number of illegal oil discharges observed in national waters	Total number of aerial surveillance flight hours performed by the HELCOM countries	Quantity of spilled products				
			0 - 1 m3	> 1- 10 m3	> 10- 100 m3	> 100 m3	n/a
2000	472	5230	442	33	2	0	
2001	390	4837	349	21	5	0	14
2002	344	4864	307	25	4	0	8
2003	278	4946	247	20	6	0	19
2004	293	5534	244	22	8	2	17
2005	224	5638	179	16	4	2	23
2006	236	5128	194	18	2	1	21
2007	238	3969	204	9	4	0	21
2008	210	4603	182	10	0	0	18
2009	178	5046	138	30	7	1	2
2010	149	4279	97	39	2	2	9
2011	122	5541	93	20	7	0	2
2012	139	4386	115	22	2	0	0

Source: HELCOM Response (2013).

Table 3. Air emissions from Baltic shipping, 2006-2012 (t)

year	NO_x	SO_x	PM	CO2
2006	327 000	136 800	29 100	15 779 400
2007	350 800	126 700	28 300	16 850 900
2008	357 600	129 900	29 100	17 462 500
2009	336 000	122 300	27 500	16 684 600
2010	346 500	92 600	23 500	17 458 700
2011	377 000	86 500	23 700	19 239 700
2012	369 600	83 700	23 100	19 012 800

Source: Jalkanen and Johansson (2012) and HELCOM (http://www.helcom.fi/baltic-sea-trends/environment-fact-sheets/.) NOTE: Transport work of Vessels with an IMO number based on AIS position data, small vessels are not included. Estimates are based on the STEAM model (Jalkanen et al., 2009).

Whereas an improvement of some environmental indicators has been reported, shipping safety and the status of safety measures introduced in the Baltic Sea remained debatable (Table 4). The number of accidents, incidents, and close calls/near misses could be considered as most widely-used formal indicators of safety. The term "accident" is generally applied when a hazardous event occurs resulting in damage or injury; an "incident" is a situation where consequences are minor or negligible and a "near miss" refers to a situation where an accident would have happened if the sequence of events would not have been interrupted in time (Storgård et al., 2011). The accident pyramid model (Heinrich, 1959) suggests that for every serious accident there are 29 less serious accidents and 300 near miss cases. Incidents

and near misses generally share same underlying reasons as accidents (Storgård et al, 2011; Jones et al., 1999). According to statistics provided by HELCOM, there has been an average 75-120 accidents on the Baltic Sea in each of the past ten years despite the efforts to improve navigational safety. There is no coherent statistics on incidents and near misses available, since in the shipping industry incident and near miss reporting is largely underdeveloped and/or conducted internally without making results publicly available (Lappalainen, 2009, 2011; Oltedal & McArthur, 2011; Kongsvik et al., 2012).

Table 4. Number of reported accidents in the Baltic Sea, 2006-2012

Year	Number of accidents	Resulted in pollution (N)	Not identified (N)	Involving tanker (%)	Number of ships
2006	110	5	2	15	9 077
2007	114	4	2	13	10 041
2008	125	9	1	10	11 359
2009	95	10	0	19	11 661
2010	111	10	3	10	12 596
2011	72	11	38	13	15 247
2012[3]	148	10	1	10	16 797

Source: HELCOM Accidents (http://helcom.fi/baltic-sea-trends/maritime/accidents/) and Jalkanen and Johansson (2012). NOTE: Reporting for all tankers larger than 150 DWT and other vessels 400 DWT. The number of ships is reported in the basis of AIS data.

The most common types of accidents are grounding (almost 50% of all cases) and collision with another vessel or a fixed structure. Cargo vessels are the main group of ships involved in accidents, followed by passenger ships and tankers. It must be noted that this pattern is not unique to the Baltic Sea, as "an almost identical share of different ship types in accidents can be observed for EU waters" (HELCOM 2010b, p.18). Furthermore serious accidents have been avoided. "Both literary and data mining showed that neither major chemical spills nor oil spills, such as *Erika* or *Prestige*, have happened in the Baltic Sea" (Häkkinen and Posti, 2013, p.24). The last major passenger vessel accident happened in 1994 (the *Estonia* disaster), and since 2003 *Fu Shan Hai* accident resulting in the release of 1,200 tons of fuel oil, no major shipping accident has occurred in the Baltic Sea (HELCOM 2010b, p.18). Human factor has been reported as the main cause of the accidents, followed by technical reasons (Harrald et al., 1998; Soares and Teixeira, 2001; Hetherington et al., 2006; Grabowski et al., 2007; Williamson et al., 2011). Concerning the environmental impacts of the accidents, in the recent years the number of accidents resulting in pollution has been stable (ca. 10 annually) and among the tanker accidents less than 5% led to crude oil or oil product spills (Table 4).

[3] The number of accidents in 2012 was the highest in the past decade. Reasons shall be investigated separately and are not treated in the present dissertation. Yet, a note shall be made in this respect. In relative terms in 2012 the tanker safety stayed at the same level: out of 148 vessels involved in accidents 16 were tankers and thereof 4 accidents resulted in pollution. Out of 10 accidents that resulted in pollution, 8 occurred due to human factor. This information may however be interpreted in the light of limited capacity of a governance system based upon technical and administrative measures to enhance shipping safety once a certain threshold in traffic density/volume has been reached. In a situation of an 'overcrowded sea', the 'software' of quality shipping, in particular, safety culture and responsible shipping operations, and its anchorage within the polycentric governance contexts requires attention (see also Section 3.3, 6 and 7.2). Source: HELCOM (2013) Draft Report on Shipping Accidents in the Baltic Sea Region, Maritime Group 13th Meeting Szczecin, Poland, 26-28 November 2013. Available from: http://meeting.helcom.fi/c/document_library/get_file?p_l_id=18827&folderId=2477596&name=DLFE-55135.pdf

"Considering both chemical and oil tankers, only very small spills have happened and their environmental impact has been neglected" (Häkkinen and Posti, 2013, p.24).

It remains difficult to assess the risk of accidental pollution in the light of existing safety measures, as estimations of the effectiveness of the existing measures are made on the basis of relatively scattered and incomplete reporting. Yet, the extension of measurement and communication of shipping environmental and safety performance indicators has brought a numerical substance into the discussion on the quality of Baltic shipping, thereby assuring broader reception of this subject-matter among the regional actors.

2.4 The Baltic Sea as a context for quality shipping

Basing on the proposition that quality governance may vary significantly between industries and geographical areas, and also considering that in globalized industries arrangements may be context-specific (Neilson and Pritchard, 2011), Section 2.1 emphasized the potential of creating more complex models of shipping quality governance by including contexts within which social interactions take place. In fact, a multi-faceted presentation of the Baltic Sea as a context for studying quality shipping (Sections 2.3.1-2.3.4) suggests that general types of collective action dilemmas, associated i.a., with potential coordination, free-riding, trust and reciprocity problems (Taylor, 1976; Hardin, 1968; Axelrod, 1984) are intertwined with special contextual features, including shipping patterns, navigational and natural conditions, politico-administrative institutions, and regulatory build-up (further elaboration on collective action theory and its application to shipping governance can be found in Sections 3.1 and 3.3).

Salience on problem closure – the urgent need to develop governance mechanisms to improve the state of the environment to, among others, reduce safety risks to shipping in the heavily polluted, shallow Baltic Sea area with dense maritime traffic – can be interpreted as an indicator that the Baltic Sea region is an 'easy case' for collective action, albeit once coordination problems between actors are solved by establishing known regularities of action (institutions). At the same time, quality shipping is achieved at an additional cost as mandatory and voluntary regulation requires investment in safety and environmental protection by the shipping industry. The way the transition to quality shipping is handled is therefore related not only to design stick-and-carrot policies (establish quality indicators and punish non-compliant/reward-compliant behavior), but also to dominant models of state-business relations (determining who will pay for quality shipping). In the Nordic countries (Denmark, Finland, Sweden) the so-called 'Nordic model', which is marked by a high degree of private sector provision of public services, enables multiple mechanisms for the alignment of public and private interventions into public policy orchestrated by the welfare state (Midttun et al., 2012). The public systems emerging over the past 20 years in the Baltic states (Estonia, Latvia, and Lithuania), Poland and especially Russia are instead marked by a high degree of separation between the state as a welfare provider and business as a profit-maker, the relationship between the two reduced to minimal interfaces (Duvanova, 2013). Thus, even common acceptance by regional actors of the special characteristic of the Baltic Sea (low salinity, cold climate, shallow depths, long coastlines, rocky and narrow fairways, icy conditions, see Section 2.3.2) as the basis for a coherent and comprehensive overall regulatory

framework for shipping (see Section 2.3.3), does not eliminate coordination problems related to the challenge of integrating private actors into the overall public governance system.

The actual research puzzle therefore is to understand how the circumstances within the BSR allow actors to coordinate with their future actions to achieve actual improvements in shipping quality. Whereas the immediate findings of this case-study can be meaningfully interpreted only within the BSR setting, the knowledge on the connecting relationship between the locality and collective action has broader analytical implications (see the discussion on contingent generalization in Section 4.1).

THEORETICAL CONSIDERATIONS

3.1 Collective action and collective action problems

The study of collective action, or the dialectics between individual and group interest that constitute the basis of societal dynamics, has a long-established history stretching from antique philosophy until today[4]. The questions of how individuals function together as organized groups and societies, and how they interact with each other on issues of common interest, are central to many branches of social science, including social philosophy, sociology, anthropology, economics, psychology, and political science. Collective action perspectives have been applied in a broad range of studies, examples include public finance (Coleman, 1966), common-pool resources such as fish stocks (Ostrom, 1990), social movements (Chong, 1991), voting behavior (Elster, 1995; Finkel and Muller, 1998), environmental activism (Lubell, 2002; Lubell et al., 2006, 2007), climate change (Adger et al., 2005; Adger, 2010), and even bidding on eBay (Kollock, 1999). In this research I use a broad definition that states that "collective action occurs when more than one individual is required to contribute to an effort in order to achieve an outcome" (Ostrom, 2004).

People engage in collective action on a daily basis; acting together was considered as one of the inherent properties of human beings in classical philosophy, including Aristotle's famous assertion from the first book of *Politics* that "man is by nature a social animal"[5]. However, collective action is not unproblematic, since "everybody's business is nobody's business" (Hardin, 1982, p.8) and if all individuals would pursue only their individual benefits, collective benefits would be difficult (or even unlikely) to achieve. Situations in which the cost and benefit of engaging in collective action are disproportionate are referred to as problems of collective action and are widely discussed in the social sciences within the framework of collective action theory. As there are different types of collective action, problems related to its functioning are also multiple (Oliver, 1993; Little, 1998). The most widely analyzed types of collective action problems are social dilemmas between individual and collective rationality resulting in sub-optimal outcomes in the absence of cooperation (e.g., as in Olson's prisoner's dilemma) and coordination problems in which individual payoffs depend on the capability to coordinate future action of the collective (e.g., as in Hardin's tragedy of the commons). Inequality prompted by specific property rights regimes in place (Ostrom, 2003), as well as instability of collective outcomes (Holzinger, 2003) have also been identified as sub-types of collective action problems.

An active development of the collective action theory began in the 1960s with the seminal works of Olson (1965) and Hardin (1968), whose theoretical perspectives shaped collective action research for many years. During the 1960s, collective action theory was conceptually linked to theories of collective goods, since it was developed within the framework of public economics, a field highly dominated by mainstream public choice theory

[4] In his seminal contribution "Collective Action" Hardin (1982) appeals to Plato, The Republic, bk.2, to illustrate one of the formulations of collective action problem in antique philosophy as conflicting relationship between justice and interest (p.7).

[5] " (…) Anyone who either cannot lead the common life or is so self-sufficient as not to need to, and therefore does not partake of society, is either a beast or a god".

that rested upon the economic model of rational behavior, or *homo economicus* - a rational self-interested utility-maximizer (Ostrom and Ostrom, 1971). Analysis of collective action was mostly conducted in relation to the subject of public goods provision, and collective action problems were often equated to externalities[6]. Externalities were seen as an indicator of collective actions problems. The classical collective action theory predicted that in situations where markets fail to allocate resources in the most efficient way, individuals will look for short-term economic benefit and fail to engage in collective action to internalize their externalities, so societies are doomed to the 'tragedy of the commons' (Hardin, 1968).

At the same time, the inefficiencies in collective action were seen as legitimation for public intrusion into market interactions and the introduction of public regulation in order to avoid or at least decrease social cost. Among the solutions to notorious market failure, classic collective action theory viewed, i.a., coercion, hegemonic power, selective incentives, process benefits and other forms of conditional cooperation as possibilities to impose collective action (Olson, 1965). Regulatory solutions to collective action problems are based either on setting standards, or charging for incompliant behavior, or setting a permit scheme. This approach, however, is criticized on the grounds that it does not address the problem, but rather provides an end-of-the-pipe solution to the consequences, nor does it allow for dealing with inefficiencies, since the cost of externality is not addressed per se. One more critique of the regulatory approach is the high enforcement cost of direct control. A lack of enforcement capacities within the states caused by flaws in a political system (not fully democratic states, lack of accountability, and corruption in administrative systems) or lack of authority in transboundary settings (situations in which 'neither market nor states' (Ostrom, 2010a, p.155) have the capacity to enforce regulation due to transboundary implementation gaps) undermine this solution.

Progress in the theory of collective action has questioned the conventional analysis of collective action problems. Among the pioneers Ostrom and her colleagues at the Workshop in Political Theory and Policy Analysis at Indiana University acknowledged that aiming at a single explanatory theory for all collective action problems is counterproductive (Ostrom, 2003, p. 242). In *Governing the Commons* (1990) Ostrom deliberately went against the Public Choice doctrine, which strived to understand collective action as a sum of individual-level processes governed by rational choice assumptions, to include assumptions of boundedly rational and moral behavior and thereby understand innovation in rules resulting in institutional diversity and complexity of social organization. In a later interview she said: "Olson, PDG (i.e., prisoner's dilemma game), the 'Tragedy,' (i.e., of the commons) they all said it could not work, but from my work with the CPR community I saw many cases and practical examples in which it did work. I saw self-organization in all parts of the world" (Toonen, 2010, p.198). In *Governing the Commons* Ostrom drew attention to the lack of empirical support of the classical predictions, especially in small- to medium-size environmental social dilemmas. Even though conventional theory suggests a necessity of

[6] Here I rely on the concept of externalities provided by Buchanan and Stubblebine (1962), who suggested that "In the process of social interaction, externalities occur whenever some actors do not take account of the consequences of their actions on others" (p. 372).

regulatory intervention, Ostrom and her colleagues noticed that cooperation may emerge without external coercion due to existence of multiple benefits (e.g., from emission reduction or other voluntary environmental actions) that actors may want to take into account. Ostrom's principal innovation – a distinction between common pool resources and public goods instead of speaking of generic collective goods – developed the collective action theory and demonstrated how cooperative strategies emerge and develop within local communities that possess the properties of rival, but non-exclusive settings. In particular, this research emphasized the role of social capital in settings where conventional theory predicted a failure. Ostrom used micro-level analysis to show how the governance problems of common pool resources can be resolved through *ad hoc* bottom-up rule-shaping and making.

In her work, Ostrom made significant progress in showing that people can form collective agreements at a local level and enforce them, thereby building trust and cooperation, therefore institutions are more built for efficacy of communication, rather than for control (1990, 2005). "Like Hayek (1945), Ostrom emphasized the importance of local knowledge of time and place. But she has extended that to local governance of monitoring and enforcement" (Earl and Potts, 2011, p.18). Individuals engaging in collective action are affected by a set of contextual variables related to the social-ecological systems in which they are interacting (Ostrom, 2009). Thus one of the open questions for contributors to collective action theory is how to work interdisciplinary "linking the broader contextual variables and microcontextual variables (…) to understand how both social and ecological factors affect human behavior"[7] (Ostrom, 2010b, p.663). Another central analytical task of this agenda is to understand the structural basis of self-organization in decentralized settings and conceptualize the principles of polycentricity (Andersson and Ostrom, 2008).

Following the development of recent decades, the present dissertation departs from seeing collective action problems as externalities within the framework of public goods theory, and rather works towards the study of collective action as a form of steering individuals and groups to achieve goals that can only be realized by a common effort. This requires promoting the broader notion of collective action, which emphasizes that "collective action can be directed at the provision of virtually any good, no matter how 'private' or 'public' the good. What is of concern is how it is provided: collectively" (Hardin, 1982, p.5). Coming back to the initial meaning of collective action, this research project continues efforts in departing from rational-choice inspired models of social explanation towards embedding collective action theory within the broader governance research agenda. In particular, it relies on the notion of interactive governance, specifically defined as "the complex process through which a plurality of social and political actors with diverging interests interact in order to formulate, promote, and achieve common objectives by means of mobilizing, exchanging, and deploying a range of ideas, rules, and resources" (Torfing et al., 2012, p.14). Focusing on actors and their interactions rather than on structures determining actor's payoffs highlights the role of intertwined natural, functional, and politico-administrative contexts in the

[7] This agenda closely relates to the questions that ANT theorists strive to unfold by engaging with the role of temporality, spatiality, and materiality in production of the 'social' (Dolwick, 2009, p.43), yet the institutionalist approach offers a different treatment of the issue, focusing on identifying causal mechanisms behind the observed events, rather than describing the associations of heterogeneous elements included in actor-networks.

emergence of institutions (rules for collective action), as agency takes place in contextually-bound governance arenas.

The central theoretical ambition of this research is to offer an analytical perspective that departs from traditional hierarchical ordering of governance practices towards integrating the polycentric character of the shipping domain. By investigating how individuals and groups work together in situations of strategic interdependence related to governing quality in shipping, it strives to show that governance of quality shipping is less ordered, neat, and structured than formal systems of rules prescribe. Yet, in the 'grey zone' where state-centric hierarchies and globalized markets would fail, negotiated interactions within issue-networks may yield positive results (Torfing et al., 2013, p.32). Focusing on the contextual embeddedness of governance practices as interactions this study seeks to shed light on how collective action problems are being addressed and how respective rules, norms and strategies which enable inter-organizational coordination may emerge and develop in the course of continuous and adaptive interaction process, rather than within a set of discrete formally-defined actions.

3.2 Defining and operationalizing quality shipping

Quality shipping is defined in this research as maritime transportation activities with a special focus on safety and environmental protection, aiming at a high standard of operational performance and economic sustainability throughout the vessel's lifecycle. The term 'quality shipping' is used both in academia and in the maritime industry, but the definition is usually substituted by a discussion of quality shipping properties. An adequate definition of quality shipping thus needs to distinguish between "quality shipping" as a goal for governance efforts formulated in public and private programs and "quality shipping" as an analytical category reflecting a combination of certain parameters (safety, environmental, and economic) on a continuous scale.

Whereas shipping is commonly understood as an activity of carrying passengers or goods on board vessel, the notion of quality'is abstract and problematic in many respects for assigning a clear-cut definition. The word "quality" has a variety of conversational uses, but in the definition of International Standard Organization quality is "the totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs" (ISO 8402). In maritime literature quality shipping has been used to describe the way to assure the safety of navigation and protection of marine environment from potential hazardous effects of commercial maritime activities (Shinohara, 2005), the potential of improvement in shipping operations associated with economic benefits (Kaps, 2004), the highest standards of health, and safety and environmental protection together with high commercial competitiveness (Danish Maritime Authority, 2013). One commonality in the use of the term 'quality shipping' in contemporary maritime literature (as well as within maritime industry) is an agreement that quality shipping is realized within (at least) two dimensions: safety and environment, and these two dimensions shall not decline, but rather improve the economic component of shipping as a business activity.

The two central aspect of quality in shipping – safety and environment – are used in this research to empirically grasp and operationalize quality shipping. Maritime safety is the first basic proxi for quality shipping, because safety has a special importance in shipping. Without safety there cannot be quality shipping as safety is the basis for sustainability in shipping (Yliskylä-Peuralahti and Gritsenko, 2014). Safety is an essential component in all the three dimensions of sustainability (environmental, economic, and social): the good condition of vessels and appliances allows for cost savings in insurance and fuel costs, minimizes spills and discharges harmful for the environment, and attracts qualified crew crucial for accident prevention. Therefore, attempts to improve maritime safety can benefit all parties involved in transportation: ship owners (ship safety as a guarantee of minimal economic losses), cargo owners (cargo safety and liability), the crew (better working conditions for mariners), and contribute to an increase of quality. Environmental performance is the second proxi for quality shipping. Protection of the environment is a relatively new notion in shipping, as the global ocean used to be a 'garbage can' of humanity for a long time before negative effects of marine pollution were recognized by researchers and addressed by public policies. As vessel-induced pollution is damaging for the ecosystem and has significant adverse impacts on human health, the environmental performance of shipping has direct implications in the areas of climate change, energy consumption, air quality, biodiversity, waste management, public welfare and security. The two empirical dimensions of quality in shipping are found in relation to the economic sustainability of maritime activities both directly (accounting for safety and environmental impact requires long-term planning and responsible investment, which may help companies to formulate their economic objectives in a sustainable manner) and indirectly (by taking a stake in environmental protection and the mitigation of negative societal effects, ship owners can improve the reputation of the company, strengthen their brand vis-à-vis their clients, and gain long-term reputational economic benefits) (Grewal and Darlow, 2007; Yliskylä-Peuralahti et al., forthcoming).

The two proxies for quality shipping are no more than a convention relevant in a certain context, whereas the way in which 'quality shipping' is understood can differ in time and space. The quality of a product can be defined through properties of this product, but in the case of services and activities, such as shipping, quality manifests through a set of practices and processes, rather than static properties. Whereas quality standards allow one to pinpoint the existing conventions, they do not contain quality, which is an elusive substance constantly reproduced in shipping operations. In order to understand quality shipping in its complexity, the investigation has to focus on dynamic, rather than static aspects. At the same time, the dynamics of quality is restricted by the agreement of definition of 'what is quality', and underlined by changes of different nature (technical, regulatory, cultural etc.). It could thus happen that practices that were considered to be 'quality shipping' become outdated with the change of the scope and therefore new practices will be required to attain the new understanding of quality.

Since there is no "quality shipping" as definite static product, quality shipping can best be grasped through the dynamic terms of improvement and decline. The improvement in shipping safety and environmental performance can be used as an indicator of improvement

of shipping quality, and the opposite. Improvement of shipping safety can be grasped through several indicators: (1) accidents, incidents, and close-calls; (2) performance in port State control (PSC); (3) development of navigational aids (vessel traffic services (VTS), traffic separation schemes (TSS), and the like). Improvement of shipping environmental performance can be grasped by looking at: (1) introduction of polluting substances (operational oil spills and discharges, air emissions (SO_x, NO_x, GHG, PM), garbage and sewage dumping, introduction of alien species, underwater noise), (2) port State control performance, (3) indicators of water and air quality. Some of this data is available for the Baltic Sea and was used in this research to show recent developments in Baltic shipping (see Section 2.3.4). The two dimensions of quality shipping have to be seen as closely connection and the indicators have to be considered in relational rather than absolute terms.

A final remark on the definition of quality shipping concerns its relation to other concepts used to describe the same idea. The term 'quality shipping' can be seen as a generic way to describe safe, secure, and environmental ways of operating and maintaining vessels that has been increasingly advocated in the shipping industry and policy-making over the past two decades by quality governance schemes associated with voluntary certification and labelling, CSR initiatives, and codes of conduct. Some of these governance arrangements, for instance, Clean Shipping Project and the EU Baltic Sea Region Strategy, refer rather to 'clean shipping' to define an approach towards maritime transport that foresees balancing the social and environmental costs of shipping in an integrated manner, i.e., throughout the whole lifecycle of vessel's functioning, and calling for integration of all relevant stakeholders who have a role to play in ensuring quality of shipping operations (Leemans and Luiten, 2005). At the beginning of this research I also tended to use 'clean shipping' as a reference for shipping that aims at safety, environmental protection, and economic sustainability. However, several deficiencies can be associated with the use of 'clean shipping' as an analytical concept because: (1) clean shipping is a commercially-loaded concept as projects under this title proliferate at the market; (2) as a commercial product clean shipping bears normativity, which can be 'neutralized' when using quality shipping concept; (3) it may lead to misunderstanding, since clean shipping is often associated with non-accidental negative environmental impacts of shipping and as a concept complementary to shipping safety and security, whereas the notion of 'quality shipping' better serves the purpose of integrating safety, security, and environmental aspects of shipping. Eventually, whereas 'clean shipping' is best understood as a policy concept and 'quality shipping' as an analytic concept, applicable to 'clean', 'green', 'blue' and other versions of shipping adhering to the paradigm of neutralizing negative social costs.

3.3 Quality shipping in the framework of collective action

Elinor Ostrom's approach to collective action offers a fruitful framework for studies on governance of quality shipping. Among the classical formulations of collective action problems such as prisoner's dilemma, chicken, battle of sexes, etc. (Oliver, 1993), quality governance can be seen as an assurance game, or a problem of coordination. "A collective-action system is an assurance game if participation with others is highly valued, there is

consensus on the direction of collective action, and the only uncertainty is that individuals do not want to participate unless others will do the same" (Heckathorn, 1996, p. 259).). Similar to the prisoner's dilemma game (PDG), in the assurance game both mutual cooperation and mutual defection are equilibrium strategies. Yet, unlike in PDG, individual defection is not a payoff-maximizing strategy, so in the assurance game participants have an interest in working together, even though transaction costs for coordination may be high (Chong, 1991, pp. 102-103). This implies that payoffs do not take the form of public goods; and previous research has argued that improved quality in shipping rather resembles a club good than a pure public good (DeSombre, 2011). Each shipping company that contributed to quality shipping can equally benefit from the improved state of shipping quality in general, as well as the related individual benefits (cost-saving from safety, reputation, reduced inspections, etc.). Despite shared understanding in the shipping sector that quality improvements pay off (in the medium and long terms), shipping companies often remain reluctant to introducing quality improvements when trying to keep short-term competitive advantage, since in shipping the cost of improving quality individually is high. Thus, quality shipping shall not be labeled as a PDG: shipping can gain considerable advantages from improvement and suffer losses from decrease of quality, yet failure to work together stems from difficulty and cost of coordination, not from a lack of rationale. Since greater participation reinforces the attractiveness of participation, coordination is seen as the biggest problem in assurance games. Quality assurance therefore requires mechanisms that reinforce trust among the participants by outlining certain negotiated voluntary contributions and prompt conditional altruism. Once shipping companies would be certain that quality improvement is a shared strategy pursued by an overwhelming majority of actors, their self-interest in quality shipping can be realized.

Since quality shipping is nothing 'fixed' or tangible, it can rather be conceptualized as an idea (Shinohara, 2005), perception (Wankhade and Dabade, 2010), or convention (Ponte and Gibbon, 2005). In shipping, the convention of what constitutes quality is shaped by multiple actors: ship owners, classification societies, authorities, cargo owners, charterers, insurers, and consumers, all of which have their own ideas of how safety and environmental issues in global shipping are to be addressed (Haralambides, 1998). A variety of actors involved in any act of maritime transportation and their interdependence allow one to describe it as collective action in the meaning adopted in this research (definition in Section 3.1). The pursuit of quality in shipping depends on the ability of maritime actors to work together: to find common language in defining it and cooperate to improve it[8].

The literature has investigated some of the aspects in maritime transportation in the framework of collective action. Among the most significant contributions which influenced this research are works by Michael Roe and Elisabeth DeSombre. In his works Roe (2007, 2008, 2009, 2012) systematically addressed the issues of maritime governance, showing how collective action problems in maritime sector led to the failure of maritime governance, thoroughly analyzing the problem in the light of jurisdictions, policy-making and

[8] As previously discussed in Section 3.2, quality can best be grasped through notions of 'improvement' and 'decline', as quality is always a goal, not a state which can be achieved.

implementation, and governance. DeSombre devoted most of her work to explaining why in particular settings collective action problems were overcome and instead of a 'race to the bottom', the maritime industry was capable of maintaining certain status quo (2006, 2011). However, the topic of collective action was discussed also in maritime logistics literature (Van der Horst and De Langen, 2008), policy-making (Pallis, 2006, 2007), and incentive schemes (Shinohara, 2005). Ng and Wang mostly investigated the seaports and aspects of collective action at the intersection of sea and land, where they found innovative ways of institutional analysis to explain how ports contribute to collective action in maritime sector (Wang et al., 2004; Ng and Pallis, 2010). Peter de Langen (2002, 2004) also used this framework to look at port clusters. These contributions opened an avenue for the application of collective action theory to shipping governance and developed an intuition that novel applications will require elaboration of the role of polycentricity in facilitating collective action in shipping.

Exploring quality shipping governance through the lens of collective action offers possibilities for approaching it in empirical terms. In this research, quality shipping has two proxi: safety and environmental quality (see Section 3.2). Most improvements of shipping safety and environmental performance are subject to collective action: minimization of air emissions requires the involvement of ports (see Article III), reduction of accidents require, e.g., the improvement of navigation safety involving coastal states, authorities, shipping companies, piloting services etc., oil spill prevention requires engagement of private actors for maintenance and inspection, cross-border cooperation of authorities (see Article IV), to name just a few. From the Hardin's classical logic of collective action, quality shipping features the properties of a "tragedy of the commons"-type social dilemma: multiactorness, interdependence, distinction between short-term benefits to self and long-term benefits to all, coordination failure. Thus, disincentives that tend to discourage joint action in the pursuit of a common goal can be expected in relation to quality shipping. For instance, a port authority may be tempted to organize fewer inspections, considering that if other states do not spend sufficient resources on inspections their own resources will be used in vain; a ship owner may be tempted to use a non-compliant fuel, expecting a low inspection probability at certain ports; a cargo-owner may be tempted to charter a cheaper vessel in a poorer condition to gain economic advantage, expecting no or little payoff from investing into chartering a high-quality vessel; and a ship management company may rely on the navigational services of VTS and piloting when manning a vessel with a cheaper, but less competent crew. A combination of such disincentives can lead to decline of quality. The classical theory offers two solutions: public intervention and private voluntary action.

The investigation of two classical solutions to collective action problems has drawn the attention of researchers to public (command-and-control) and private (voluntary) rules and norms through which quality can be institutionalized in shipping. Several studies have shown that whereas command-and-control regulation has been effective to set the minimum quality standard in ship construction, equipment, and maintenance (Payoyo, 1994; Tan, 2006; Knapp and Franses, 2009), private voluntary standards contributed to the institutionalization of quality practices in ship management and operation (Furger, 1997; DeSombre, 2009; Wuisan et al., 2012). Besides compulsory regulatory standards embedded in formal rules and private

governance schemes maintained through voluntary standards, complex quality information is contained in multiple 'unwritten rules' that emerge as a product of interactions of various actors in respective contexts. The co-existence of public mandatory and private voluntary dimensions in shipping governance highlights its complexity. An examination of the structures that engage governments, non-governmental organizations, private actors, consumer groups, and other interested parties constitutes the first step in unveiling the polycentricity of shipping governance. Improvement of quality in shipping can therefore be analytically addressed as a multi-faceted and cross-jurisdictional problem, an issue treated at different levels and scales simultaneously. Yet, the effectiveness of private and public measures taken separately or in combination remains an empirically open question. There is little empirical evidence that proves the superiority of polycentric governance over a monocentric system of rule in terms of performance (Huitema et al., 2009). The meaning of polycentricity to governance of quality shipping is addressed in this research.

In addition to technical and navigational facets of quality, the human factor is an important aspect of quality shipping. The qualifications and motivation of a ship's crew are among the central factors that assure the quality of on board operations and safety performance (Hetherington et al., 2006). Despite significant improvements in ship design, the human factor is still responsible for the majority of maritime accidents (Trucco et al., 2008; Kujala et al., 2009). Lack of skills and motivation, tiredness and fatigue, difficulties in multicultural and multilingual communication all create significant challenges in ensuring quality shipping (Grech et al., 2003; Flin et al., 2008; Williamson et al., 2011). In tanker operations "human, organizational and management factors, rather than physical and mechanical attributes" were proven to be responsible for organizational safety performance (Grabowski et al., 2007). Assessing risks in oil transportation in the Gulf of Finland, Nikula and Tynkkynen (2007) underlined the key role of risk perceptions of the maritime authorities in securing safe and environmentally-sounds operation.

Despite the recognized importance of the human factor in ensuring quality shipping, the problem has not been systematically approached at the governance level (Kuronen and Tapaninen, 2010). International conventions that explicitly address the human element as a precondition to achieve and maintain high standards of safety and environmental protection at international level (e.g., the International Safety Management (ISM) Code, The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), the Maritime Labour Convention (MLC)) succeeded in setting the minimum global standards for crew qualification and training. In practice, qualification required for successful navigation can vary largely depending on the local conditions (for instance, in the Baltic Sea winter ice coverage, shallowness, varying depth, archipelago rocks all require special navigational skills), which makes global regulation partial and often insufficient. When it comes to requirements to crewing and manning, the maritime industry often relies on voluntary standards (e.g., ISO), certification schemes, HSEQ (health, safety, environment, and quality) management, and vetting inspections. Technically speaking, quality shipping emerges as a result of a qualified crew skilfully operating a technically advanced vessel. However, this does not mean that quality shipping is always linked to a certain technical or organizational

procedure. Rather, it is being realized by a variety of actors involved in marine transportation, who seek to shape institutional frameworks in which physical activity of shipping takes place.

In the absence of effective implementation and coordination systems, any increase of shipping quality may be considered as a paradox and require an investigation of the mechanisms that made collective action successful. Academic investigations have recently turned to the motivations behind quality shipping (Fafaliou et al, 2006; Skovgaard et al, 2007; Cheng and Choy, 2013), as well as to the relationship between incentives schemes incorporated in shipping governance structures, and the proliferation of quality thinking in shipping (Hawkins, 2001; Shinohara, 2005). Most of these studies directly or indirectly acknowledged the problem of 'fit', meaning the appropriate governance level at which quality shipping shall be addressed. Although tensions between 'global' and 'local' are recognized as characteristic for the shipping industry, which features and traits of quality shipping are global and universal and which are context-specific is a question that requires further examination.

Summing up, what we know about quality in shipping is that: (1) it is a convention shaped my multiple actors; (2) it has a hard (technical) and soft (human factor) components; (3) it is indebted to command-and-control regulation and to voluntary measures. However, this does not allow us to come closer in understanding how quality shipping emerges and develops, especially given that trends towards both improvements and declines of quality in shipping can be observed in the globalized shipping industry. Thus, this research engages into empirical investigation of the specific circumstances around governance of quality shipping in the Baltic Sea region.

3.4 Core concepts to theorize quality shipping and their interrelations

The following section presents a conceptual model for studying quality shipping governance. Since quality shipping is a dynamic category that manifests itself through a set of practices rather than a set of regulations, it can be grasped through studying the interactive processes in which rules, norms, and strategies that denote and materialize practices associated with quality in shipping emerge and develop. This research establishes a theoretical model of quality shipping through the lens of collective action using the key concepts of governance, institution, polycentricity, and actors and their interaction. Since these concepts are multi-faceted and have legacies within multiple theoretical traditions, in what follows their use and operationalization in this research is elaborated. There is no ordering among these concepts, i.e., they are all interconnected and follow the overall ontology and epistemology of the research project.

3.4.1 Governance

a) What is governance?

Governance is without exaggeration a "buzzword" (Jessop, 1998), a contested and "fashionable" concept "stretched beyond any useful meaning" (Benz, 2004). Robichau (2011) in an overview of existing definitions, theories, and debates on governance suggested that "the complexity of governance conversations" shall not preclude us from engaging into research of governance, rather, the agenda shall move "beyond classifications and generalizations" and towards empirical explorations (p.114). The ability of the governance

concept to highlight the complexity, variety, and ever-changing nature of societal organization justify its inclusion among the key concepts of this study.

Not going too far into the history of social sciences to search for the emergence of governance concept, it is noted that in its current form the concept of governance gained popularity during the early 1990s. In his seminal analytic literature review Rhodes (1996) defined six ways of using the word governance. In 1998, Stoker put forward five propositions to highlight various aspects of governance, and other scholars joined these conceptual debates, adding up to the "Babylonian variety of definitions and understandings of governance" (Börzel, 2005, p.3). One of the few stances that unites the highly diverse body of governance literature produced during the last two decades is that by emphasizing "plurality of interconnected policy arenas, the mutual exchange of knowledge, resources, and ideas through negotiated interaction, and the blurring of the lines of demarcation between the public and the private realm" (Torfing et al., 2013, p.11), governance offers a fresh perspective on such fundamental questions of political science as the role of the state and the nature of policymaking.

In the discipline of international relations, the governance perspective is built upon the intellectual tradition developed by regime theorists (Keohane and Nye, 1977; Krasner, 1983; Young 1982). Moving the emphasis away from state actors, they explicitly added the non-state actors to the study of the mechanisms and procedures of international co-operation. During the 21st century the intellectual program of regime theorists in the field of global environmental governance has moved on from understanding the patterns of international cooperation and singling out factors for regime efficiency to scrutinizing interactions between regimes, including the multi-level settings (Hassler, 2011, p.171). Institutional interactions in international cooperation investigated by regime analysts mainly constitute elaborate typologies and categorizations, yet, the analytical tools to uncover the causal mechanisms and driving forces of the institutional interaction are limited in their tool-kit (Oberthuer and Gehring, 2006, pp. 4-5). Closer attention to multiactor processes distinguishes the interactive governance approach adapted in this dissertation from regime analysis.

Jessop (2002a) noted that (1) denationalization of statehood, (2) de-statification of politics, (3) internationalization of policy-making have all contributed to gradual loss of monopoly on public policymaking by the traditional state structures and gradual increase of private actors involved in the formulation and implementation of public policy. Exactly this central property – the blurring of boundaries between regulators/governors (usually the public government) and regulatees/governed (usually the private sector) – is what the concept of governance seeks to convey to social research. Among the central themes in governance research is the assertion that in recent decades the ways in which societies manage their affairs have acquired some new properties as regards to traditional forms of power distribution. The formal institutions of the state no longer hold a monopoly of legitimate coercive power (Stoker, 1998) to maintain public order, and in the absence of clearly defined authority in decision making, governance recognizes multiple levels, centers, and ways in which public affairs are managed. The roots of transformation from the 'old' to the 'new' forms of governance are often identified as lying in globalization, which made the world

increasingly polycentric, less hierarchically sovereign, more networked and interdependent (Kohler-Koch, 1996; Benz, 2004; Osborne, 2006; Heritier and Rhodes, 2011). The transformation in the system of societal steering is often labeled as 'new governance' and understood as something fundamentally different from the 'old government'. However, governance has always been a part of social reality and the ‘old government’ can be viewed as a specific form of governance, so that governments continue to play a crucial role in governance (Kooiman, 1999, 2003a).

The emerging form of societal steering referred to as the ‘interactive governance approach’ (Kooiman, 2003b; Torfing et al., 2012) is compatible with a working definition of governance as a “process by which the repertoire of rules, norms, and strategies that guide behavior within a given realm of policy interactions are formed, applied, interpreted, and reformed” (McGinnis, 2011, p. 171). Unlike approaches that conceptualize governance as a static outcome of a political process, interactive approach exploits governance as a concept that allows grasping the complexity of institutional development and change. Governance is therefore fundamentally about institutions and denotes the process of the formation of rules for collective action. The concept of interactive governance goes beyond the classical ‘state vs. market’ dichotomy, emphasizing that public policy can be shaped and made at different and interconnected sites and scales. Exploring collective action through the concept of governance as a process of ‘getting things done’ (Stoker, 1998) in a multiactor interaction on issues of communal interest offers a way to study collective action by paying attention not only to states and markets, but also considering a broad array of actors and their actions in the ‘grey zone’ between hierarchies and horizontal coordination. Thereby, the interactive governance approach is compatible with the study of polycentricity as its analytical tools can uncover and explain how multiple autonomous actors interact in fragmented cross-jurisdictional and extra-territorial settings.

“In generic terms, governance can be defined as the process of steering society and the economy through collective action” (Torfing et al. 2013, p.11). Therefore, an interactive perspective upon governance comes back to the fundamental problem of the role of the state in policymaking by contributing to the classical political science agenda that is preoccupied with the questions ’How much state is necessary?’ and ’How to resolve state vs market controversies?’ through de-coupling collective action from any particular institutional form of governance, be it state, civil society, or networks, and asking ’How can the societal effort of managing issues of common interest be balanced given institutional diversity and complexity?’ Problems of collective action have been the “core justification for the state” (Ostrom, 1998) and public regulation by a government has been long seen as the only form of governance. Yet, transformations in the social system have shown that traditional governance-by-government is only one mode of tackling the problems of collective action, whereas governance-with-government and governance-without-government have been recognized as alternative modes of societal steering (the typology of governance forms on the continuum from governance-by-government to governance-without-government can be found in Börzel, 2010, p.9).

The study of shipping quality can benefit from including the concept of interactive

governance, since no single actor, public or private, has the knowledge and capacity to solve complex, dynamic, and diversified problems related to shipping quality. The governing of quality in shipping involves a plethora of public and private actors and governance allows describing the multi-directional (horizontal, vertical, and diagonal, see, e.g., Lowndes and Skelcher, 1998, Ackerman, 2004, Bovens, 2007) interactions between these multiple actors. Individual studies of quality governance in shipping can be of great help to better understand the interplay of general and specific mechanisms that ensure quality in shipping. Such investigation can also be useful for exploring quality governance beyond shipping. Summing up, quality shipping can be studied by examining the emergence and functioning of mechanisms that institutionalize collective action efforts.

b) How to study governance?

The study of governance is tightly connected to how governance is conceptualized. Since the concept of governance is compatible with different approaches to the study of social phenomena, depending on the meta-theoretical presuppositions and theoretical assumptions certain features or issues in governance can be emphasized, whereas others could be left less elaborated (Bevir, 2010). Therefore, looking at governance from a certain perspective implies corresponding assumptions of existential nature (ontology), knowledge production (epistemology), and ways of investigation (methodology). If governance is conceptualized as a network, it can be studied by means of network analysis, if as a discourse – discourse analysis, if as a process – process-tracing can be employed, etc. In a recent book edited by Mark Bevir (2010) a fruitful way of approaching the concept of governance is presented. The book claims that governance can be a conceptual element of different theories built upon different foundations by showing how theories and approaches (including network, organizational, development, institutional, system theories, rational choice and interpretative approaches) link governance to the other concepts inherent to these theories and approaches, thereby creating synergies and advancements. Acknowledging the variety of conceptual uses, it shows impacts that interpretations informed by different analytical traditions have had upon empirical research and theory-building. A lesson to be learnt from this volume is that governance is never an independent variable, but always the phenomenon under study.

It does not appear viable to provide a comprehensive analysis of the recent literature on use of the governance concept in social science research, but the central features of governance noted in the scholarship can be briefly sketched. Firstly, the scope of governance actors is broadened, as it is noted that “no single actor, public or private, has all knowledge and information required to solve complex, dynamic and diversified problems” (Kooiman, 1993, p. 4). One of the consequences of the broadened scope of actors is the changing role of central government due to the fragmentation of governing authority and proliferation of private governance forms. Secondly, the scope of social coordination forms is broadened (including multi-level, non-hierarchical, networked, horizontal, and diagonal), affecting the process of societal steering by introducing new ways to solve issues of common interest. One more characteristic of the interactive perspective on governance is that it does not limit the scope of investigation to the instances of cooperation and conflict, but allows for the inclusion

of the whole range of "mutually influencing relations between two or more actors", such as coordination, adaptation, competition, and exchange at the micro-level, which lead to large societal interactive phenomena such as interferences, interplays, and interventions (Kooiman, 2003b, p. 13, pp.79-80). Summing up, governance is a complex (multi-level, polycentric, multiactor) interactive process; thus, the study of governance necessarily includes: (1) many site of decision making; (2) many actors and multiple interactions between them; (3) timeframe and spatiality. In order to grasp multiple interactions between many actors in many places, process tracing and similar qualitative methods can be used to reflect on multiple interdependent variables (Sandholtz and Sweet, 1998; George and Bennett, 2005).

Any governance interaction relies on a system of institutions that structure practices in this situation; whereas institutions are the rules of the game, governance is the process in which these rules are being shaped, applied, and reformed. From this perspective, the study of governance is a study of 'how' of socio-political process, since in governance process rules, norms, and strategies (that is, institutions, see Section 3.4.2) are being created, developed, and changed. The institutional approach to governance as an interaction in which institutions are created, applied, and modified, suggests that the study of governance can be undertaken as a study of mechanisms by virtue of which institutional development takes place. The interactive governance perspective draws the researcher's attention to: (1) the multiplicity of actors, whose number, positions and other intrinsic characteristics are subject to empirical verification, rather than a set of theoretically predefined parameters; (2) the variety of governing interactions, where a set of allowable actions and their outcomes are constrained by conditions both internal and external to the process under scrutiny; (3) the role of both formal and informal institutions in structuring the process. In empirical research of shipping quality the study of governance is rooted in analysis of all the above-mentioned elements, including actors who are involved, their strategic interactions, the multiple interconnected contexts in which interactions are embedded, and how institutions structure the interaction. While creating a bottom-up account of how collective action emerge and proliferate, attention to governance as an interactive process allows one to address questions that require further treatment in institutional theory, as they uncover the roots of both cooperative and conflict behavior.

3.4.2 Institution

a) What are institutions?

The notion of institution is rather broad and has been widely used in scholarship (for overviews of different uses see, e.g., Rutherford, 1996; Crawford and Ostrom 1995; Ostrom, 2008). Ostrom (2005) provides an extensive analysis of contemporary terminology used in institutional analysis and identifies a problem of "babble about rules and norms" with no consensus of what these terms stand for (pp. 177-179). Indeed, while traveling across time, space, disciplines, topics and individual researchers, 'institution' has become no less of a buzzword than 'governance'. To describe institutions, scholars may use terms 'rules', 'norms', 'shared understandings', 'conventions', or 'equilibria' interchangeably or make

distinctions. Thus, it seems to be crucial to explicate the understanding implicit to this research.

This research relies on the seminal definition by D. North “institutions are rules of the game” (North, 1990). This definition grasps the central properties of the concept in a broad, but clear manner: whatever social interaction we enter, there are certain *do's* and *dont's* associated with it. The advantage of a broad definition given by North is that it can be accommodated within all institutional traditions and types of institutional analysis (for a discussion on the development of the institutionalist approach and its types see Section 4.2). However, its drawback is that it only states that 'institutions do matter', but does not show where institutions are contained, neither address the issues why and how they matter. Regarding the nature of institutions, according to North institutions “consist of both informal constraints (sanctions, taboos, customs, traditions, codes of conduct) and formal rules (constitutions, laws, property laws)” (North 1991, p. 97).

Whereas formal institutions are usually seen as written rules, which are relatively easy to access and analyze, informal institutions are defined as “socially shared rules, usually unwritten, that are created, communicated, and enforced outside officially sanctioned channels” (Helmke and Levitsky, 2004, p. 727). As the tacit character of informal institutions adds uncertainty to their conceptualization, researchers sometimes anchored the concept of informal institutions within other concepts, such as culture. However, no equals mark can be placed between informal institutions and culture, as their relation is of interdependence (see a discussion on the logic of appropriateness and logic of calculus in Section 4.3.3). Gel’man (2012) noticed two traditions in the treatment of informal institutions in social research: formal and informal institutions can be seen as factually and analytically separate categories, as two sides of the same coin juxtaposed to each other. The second tradition “considers “formality” and “informality” (…) as mutual coexistence of a visible institutional façade and often invisible institutional core” (p.297). Thus, both informal and informal institutions create a symbiosis when it comes to “rules-in-use” (Ostrom, 2005).

Recognizing the variety of institutional forms allows the pursuit of a more contextually-sensitive empirical investigation. In this research the idea of institutions as rules, norms, and shared strategies developed by Crawford and Ostrom (1995) is applied. The distinction between the three is made as follows: *rules* are the most prescriptive type of an institution that encompasses indications of who is supposed (not) to do what, when, where, and how non-compliant behavior will be prosecuted; *norms* are also prescriptive but do not presuppose any formal punishment for non-compliance; and *strategies* do not contain normativity but rather describe common communication patterns. All three forms of institutions can be formal (written, codified) and informal (unwritten, tacit). The emergence of new institutions, both formal and informal, can be understood as an evolutionary process (Hayek, 1973; Williamson, 2000), an unintentional result of a continuous accumulation of tacit knowledge through problem solving, and as an intentional institutional design where choices upon rules are made in a trial-and-error process (North, 1991; Ostrom, 2005). Importantly, all institutions are man-made.

Empirical research on governance has revealed the “incredible diversity of rules

designed and enforced by participants themselves to change the structure of underlying social-dilemma situations" (Ostrom, 1998, p. 12, further refers to i.a. Blomquist, 1992 and Lam, 1998). Institutional diversity is one of the core ideas of Ostrom's scholarship and a valuable concept for understanding polycentricity, as it puts an emphasis upon the centrality of institutions to the process of governance. The fundamental idea behind polycentricity - the ability of groups to pursue collective action – is tightly bound to the idea of institutional diversity. The existence of many institutions is *prima faci* evidence that local communities have the knowledge and skills to address problems they are facing by experimenting with rules and responding to the specific issues at stake by adjusting the system of governance. As a result, among all types of institutions constitutional rules – or rules of changing rules – are the basis for realizing the potential of polycentricity.

b) How to study institutions?

Due to conceptual blurring, institutions are often denoted in a very broad way, which does not specify where they come from and how they work, or why actors feel constrained or enabled in their actions by the existence of institutions. In accordance with the ontology and epistemology of this research, in order to be able to study institutions, there is a need to be able to identify and specify them empirically (a discussion of meta-theoretical commitments can be found in Section 4.1). Since institutions are not 'hard facts' and cannot be studied directly, the empirical study of institutions can be pursued by studying interactions and revealing which rules, norms, and strategies are being followed by the actors involved in quality shipping governance. Whereas formal rules and norms are mostly visible (e.g., those codified in maritime law), shared strategies, such as quality practices habitually followed on board a vessel, are rather difficult to grasp and require in-depth qualitative investigation. It has to be kept in mind that the maritime sector is one of the few globalized industries where customary law has a strong and to a certain extent a prevailing position, which poses an additional challenge for study of institutions in this domain.

Being a product of human interaction, institutions in turn influence human interaction, the logic of the creation and maintenance can be rational utility maximization, or understanding of appropriate behavior, or a mixture of both. In research practice, institutions are "spoken, written, or tacitly understood in a form intelligible to actors in an empirical setting" (Crawford and Ostrom, 1995, p. 583) entities that can be expressed in language and in action. The goal of empirical institutional analysis is to single out institutions from the data (empirical material) by distinguishing which type of mechanism stands behind an institution and eventually exploring institutional development and change. Institutional mechanisms can be revealed both from textual material and through reconstructing the processes. The search for institutional mechanisms can contribute to the explanation of the social phenomenon in question by elaborating its institutional embeddedness, since mechanisms are sensitive to contextual variation. At the same time, identification of institutional mechanisms does not explain behavior in institutions, thus the study of institutions cannot be detached from a theory of action, or a series of underlying assumptions about the actors and their behavioral motivation (see Section 3.4.3).

Summing up, the institutions for collective action in quality shipping are systems of incentives and sanctions that structure complex interaction in the maritime industry. Institutions are central to the process of managing and regulating shipping quality, since they allow the involved parties to explicate mutual expectations about quality. Broadly speaking, governance of quality is associated with institutionalization of certain formal or informal agreements that contain quality criteria. One of the central methodological challenges in understanding the role of institutions in the success or failure of collective action, is revealing the mechanisms that stand behind emergence and development of (successful) institutions.

3.4.3 Polycentricity

a) What is polycentricity?

The concept of polycentricity – recognition of (co-)existence of many decision-making centers – first appeared in modern social science scholarship in the mid-20th century. Michael Polanyi in the *Logic of Liberty* (1951) and Ostrom, Tibout and Warren in *The Organization of Government in Metropolitan Areas* (1961), declaredly independent of each other (Ostrom 1991, p. 224), described systems of social order driven by the same principle: the existence of autonomous decision-makers pursuing their goals independently of each other within a common overarching framework in which conflict resolution does not depend on any central mechanism or a reference to an external authority, but rather on a system of internal references. Polanyi argued that scientific community exhibits polycentric properties and that it is polycentric organization that made scientific progress possible. In the scientific community individual researchers work independently, yet, still taking account of each other's previous achievements. Eventually, concurrence of the overall scientific endeavor is prompted by the "joint acceptance of the same fundamental scientific beliefs" (Polanyi 1951, p.26), revolving around the ideal of searching for 'scientific truth'.

Ostrom, Tiebout and Warren's (*OTW*) seminal 1961 paper examined competitive public economies within metropolitan areas. This paper is programmatic, as it re-considered the propositions of conventional public choice theory that held hierarchical structure as an ideal state of public administration, also known as the "classical-modernist" approach to governance and policy-making (Ostrom and Ostrom, 1971, p.204; Hajer, 2003). *OTW* suggested that 'duplication of functions' and 'overlapping jurisdictions' are not pathologic and metropolitan government is not a chaos that needs to be fixed by re-organization of multiple units into a general framework and the introduction of an external authority. On the contrary, *OTW* propose that metropolitan government may be a system of another kind – a "polycentric order" in which formally independent centers of decision making constitute an interdependent system in which units "take each other into account in competitive relationships, enter into various contractual and cooperative undertakings or have recourse to central mechanisms to resolve conflicts" (Ostrom, Tiebout and Warren, 1961, p. 831). In his later work, V. Ostrom advocated the application of the concept of polycentricity to a variety of other administrative constellations, including competitive public economies, scientific inquiry, law and adjudicatory arrangements, systems of federal governance, and international affairs, with the goal of exploring the basic aspects of self-organization (Ostrom, 1991).

A recent attempt to explore the concept of polycentricity from Polanyi to Ostrom, and beyond by Aligica and Tarko (2012) extended the list of phenomena "suspected of polycentricity" (p. 249) to include any social groups and/or networks based upon spontaneous order related to a common set of overarching end goals as special cases of polycentricity, emphasizing social self-organization as a unique evolutionary phenomenon (p.251). They also provided a scrupulous analysis of anarchy as a social phenomenon that helpfully draws a line between the two, putting an emphasis on the existence of multiple centers of decision making 'within accepted set of rules' as a main distinctive feature of peaceful anarchy (polycentricity) from chaotic and violent anarchy (p.250).

Table 5. Basic features of polycentricity: a comparative overview

Vincent Ostrom (OTW)	**Bloomington School (McGinnis and Ostrom)**	**Aligica and Tarko**
(1) many autonomous units formally independent of one another, (2) choosing to act in ways that take account of others (3) interacting through process of cooperation, competition, conflict, and conflict resolution	(1) freedom to enter/exit; (2) legitimate exercise of coercive capabilities; (3) overarching system of rules; (4)existence of constitutional rules (rules on how to change rules); (5) incentives alignment.	(1) multiplicity of decision centers ("active exercise of different opinions"); (2) institutional and cultural framework that provides the overarching system of rules defining the polycentric system; (3) spontaneous order generated by evolutionary competition between the different decision centers' ideas, methods, ways of doing things

Source: own compilation upon V. Ostrom (1991), McGinnis and Ostrom (2012), Aligica and Tarko (2012).

The polycentric systems are expected to perform better when complex and uncertain issues (also known as wicked or superwicked problems, Levine et al., 2012, see Section 6.3) need to be addressed. The reasons are (1) improved equivalence of problems and solutions as rules are scaled to impact; (2) improved resilience, as functions of a unit can be taken over by an overlapping unit in case of failure; (3) improved flexibility, as the existence of multiple units enables mutual learning and provides room for experimentation (Huitema et al., 2009). This makes polycentric systems issue-specific and turns extra-territoriality, cross-jurisdictional overlaps and non-hierarchical ordering into its strengths. At the same time, polycentric systems are prone to coordination failures, increasing transaction costs, and loss of democratic accountability (Imperial, 1999; Sørensen and Torfing, 2005). Yet, polycentricity offers a novel lens to reassess the way we understand maritime governance by offering a broader empirically-driven perspective on elements, relationships, and processes within it. In its turn, the study of shipping quality governance as a case of polycentricity has the potential to enlarge the still limited empirical understanding of the operational characteristics of polycentric systems.

b) How to study polycentricity?

Most studies on polycentricity have taken an exploratory character, continuing the program set by *OTW* based on the idea that "no a priori judgment about the adequacy of a polycentric system of government vis-à-vis single jurisdiction government can be made without a

thorough empirical investigation" (Ostrom, Tiebout, Warren, 1961, p. 838). Vincent Ostrom pondered conceptual links between polycentricity, federalism and constitutional choice (self-governance) (Wagner, 2005); Elinor Ostrom sought to understand polycentricity in CPR dilemmas and global environmental governance; Michael McGinnis continued explorations of the local public economies line (1999). Polycentricity found its way into studies of the EU organization (Kauppi, 2005; Rayner and Jordan, 2013; Zeben, 2013) and prominently of environmental governance (Cole, 2011; Galaz et al., 2012). Roe (2007, 2012) applied this concept to shipping. European spatial planning, regional geography and urban studies developed an independent tradition of studying polycentricity referring to spatial development, the relationship between rural and urban areas, and increased efficacy of governance through scalar politics (Peters 2003; Asheim et al., 2012). And yet altogether, the study of polycentricity has not been very extensive (Aligica and Tarko, 2012, p.237) and empirical tests of polycentric order of governance are few (Lieberman, 2011).

Given a limited understanding of the operational characteristics of polycentric systems (Gruby and Basurto, 2014), the main bulk of contemporary studies on polycentricity is devoted to the understanding of their structural components and principles of functioning, underpinned by a normative goal to extend and maintain the principles of polycentricity "through the whole system of human affairs" to achieve "progress in human societies" (V. Ostrom, 1991, pp. 243-244). Study of polycentricity at individual level may be pursued by study of polycentric games. McGinnis (2000) explains that polycentric games encompass both two-level games (Putnam, 1988) and nested games (Tsebelis, 1990) to reach out to a model of an actor involved simultaneously in many games and drawing on information emerging from this wide array of interactions to make sense of the behavior of other actors in each single situation, thus, cross-effects of concurrent games emerge. Aligica and Tarko (2012) developed a logical structure of polycentricity, an analytical framework equipped with tools to analyze existing complex systems, map the aspects of polycentricity within them, as well as design adjustments through policy change (p. 257).

Finally, normative perspectives on polycentricity can also be found in research. Goldthau (2014) claims that the governance of energy infrastructure need to be polycentric in order to remain sensitive to change and equivalent to scale. Roe (2013) advocates a need for a governance system capable of accommodating movement, change, and dynamism characteristic for contemporary shipping, and speculates on perspectives of polycentric arrangements in the maritime domain. In this dissertation the notion of polycentricity is considered as a descriptive term. It seeks to establish shipping as a phenomenon prone to polycentricity by exploring empirically when quality concerns are addressed in a polycentric manner and asking what implications does it have for the patterns of collective action.

3.4.4 Actor and interaction

a) Who is an actor?

"The actor in a situation can be thought of as a single individual or as a group functioning as a corporate actor" (Ostrom, 2011, p.12). By this definition, an actor is an *acting* individual or group; therefore, the central insight about actors refers to their intentionality – how actors

enter interactions and what governs their behavior. Intentionality can also be used as a basis for distinction between actors and contexts (see Section 2.1 for further discussion on the treatment of context in this research). Intentional single-actor and joint or collective actions are the basis for the attribution of agency to human and social entities and an expression of how humans construct the social world through various forms of social interaction. In line with the critical realist ontology underpinning this research, intentions, or actor's reasons to act, are treated as real and causally efficacious. Explanation of social interactions requires a reference to intentional activity, because without an intentional causal agency the "bodily movement" (activities, debates, discourses and the like) would not occur (Irwin, 1997).

Usually in social research the motivational structure of actors, in other words the agency, belongs to the core assumptions. Among the classical approaches are 'utility-maximization' (Nash, 1950), 'bounded rationality' (Simon, 1972), 'cultural bias' (March and Olson, 1984), and 'social learning' (Parsons, 1991). The assumption of 'utility-maximization' is typical for methodological individualism. Adapted in rational choice theory, it pictures humans as self-interested agents reasoning about costs and benefits in terms of their own often short-term preferences. The idea that individuals are capable of calculating rationally the outcomes of their actions was challenged by the introduction of the notion of 'bounded rationality' to deal with limitations of information imperfections and integrate risk and uncertainties. The notion of 'cultural bias' was helpful in order to emphasize the role of broader social context in decision making. A thick description of the environment in which actors make their choices can help to define their opportunities to pursue interests (own or collective), social institutions that both constraint and enable individual action, and the role of norms and values in shaping individual behavior. Finally, the idea of learning about heuristics, norms, and rules, as well as about how to craft new rules to improve the outcomes of social interaction has finalized the era of early and 'thin' approaches to rational choice. Ostrom (1998) claims that the first-generation models of rational choice based on individualism led us to assumption that individuals are trapped in social dilemmas. However, the existence of bounded rationality which does not allow actors to calculate best strategies and moral behavior that brings forward latent collective intentions (or 'cultural bias') together allow individuals to develop heuristics, learn how to devise new rules and cooperate conditionally.

In this study the position that links individual rationality (logic of calculus) and culture (logic of appropriateness) is adopted. This position assumes the logic of appropriateness as actors' deep unconscious motivation underlying their actions. The logic of calculus in economic terms seems to be unambiguously continuous, because by any condition it follows the rule 'less input, more output'. The logic of appropriateness in turn is subject to determination and the change of determinants may provoke a change in the logic itself. So if changes of utility function can be compared to a shift along the curve, those of cultural function are shifts of the curve itself. Eventually, the logic of appropriates defines the range of possible actions, and the logic of calculus – a concrete action. Little's thought experiment on traditional village (1998, p.98) is a vivid illustration of the effects of reducing the 'thinness' in description of agency and structure. Picturing the narrow economic rationality as a special case of rational action, Little develops a notion of 'practical rationality' – goal-directed and

calculating actors adopt local normative commitments, and proves the local circumstances of choice (institutional and cultural contexts as well as person-to-person arrangements) to be decisive in understanding collective action patterns (1998, p. 120).

This approach is dissimilar to most of rational choice approaches (e.g., 'revealed preferences' approach of Samuelson, 1948), as it suggests that actor's interest cannot be simply calculated and can only vaguely be approached through qualitative investigation of actors' practices, thus, calling for more inclusive and contextually-sensitive inquiry. It holds that intentions that drive an actor's behavior are not only individual, but also collective, meaning that some actions take an individual mode, but this individual mode constitutes a special case of social action. Collective intentionality theory claims that sometimes our individual intentional attitudes are devised from a collective "we-mode" (Tuomela, 1995), which, however, does not imply a collective intention to perform an action (Gilbert, 2006). Since most actors are not taking into consideration their 'cultural bias', they think to act rationally and reason as if they were to maximize their own utility. Saaristo (2006) argues that "the tendency to put aside considerations tied to the individualistic perspective and to adopt a collectivistic viewpoint to the situation at hand" can explain cooperation in collective action dilemmas (p. 43).

At the beginning of my research I often used the concept of stakeholder (this term appears in Articles I, II and III), but for a number of reasons I proceeded with the above-mentioned understanding of an actor and avoided the use of term stakeholder at the final stages (Article IV and the present text). As management literature claims, a stakeholder is not simply any actor, but one with a "legitimate interest", thereby this concept allows seeing an organization embedded in its environment and determined by its relationships with it. Stakeholders hold a stake in a certain (political) enterprise; they can affect or are affected by the achievement of an organization's objective (Freeman, 1984, p.46). The stakeholder theory recognizes the importance of collaborative action. It proposes for each issue at stake to (1) identify the stakeholders; (2) identify their preferences and (bargaining) position; (3) assess their potential influence and salience (Mitchell et al., 1997). The outcome of such analyses provides an estimation of the level of policy consensus important both for its democratic legitimation and for the success of implementation. In a sense, the stakeholder approach allows for the creation of a precise list of stakeholders as regards to any stake to be scrutinized, thereby helping to solve the problem of 'units of analyses' (only those who can affect and/or be affected are included in the analysis). On the other hand, in practical terms stakeholder analysis is highly problematic when dealing with globalized and transboundary issues, such as shipping. For the analysis of matters of public policy where the scope of boundaries are not set by territorial rules and "actors come and go depending on their assessment of, and interest in, specific issues" (Torfing et al., 2013, p.87), the added value of the stakeholder concept is blankly annihilated by its empirical ambiguity.

b) How to study actors and their interactions?

An actor can be described in two dimensions: type (individual, collective, public, business etc.) and position in governing interaction (rules demanders, suppliers and targets, Buethe,

2010a). Thus, the study of actors is rooted in study of action. Any individual or collective acting in regard to the policy problem is regarded as relevant. Once an inclusive, detailed account of interaction is created, its participants can be classified by type and their positionality can be analyzed. Therefore, in relation to action, the category of actor is seen as empirically open, meaning that actors' number, positions and other intrinsic characteristics are subject to empirical verification, rather than theoretically predefined parameters.

The maritime domain is characterized by a high number of actors of different types. Depending on the ambition and goal of the study, research can be conducted at the level of individuals (e.g., in safety research focus on seafarers or in shipping CSR focus on managers) or groups. This research concentrates on groups functioning as corporate actors, e.g., ship owners, insurers, port authorities, cargo owners, charterers, and the like, as it seeks to clarify how these groups interact and shape institutions, rather than on how institutions shaped in this interaction affect behavior at the individual level. Though the two processes are interrelated and difficult to separate in empirical settings, an analytical distinction can be made to facilitate concept operationalization.

Interactions are understood here as social phenomena that involve more than one actor and more than one action (i.e., action and reaction). The aspect of mutual influence in social interactions is intentional, though, not necessarily seeking mutual benefit, and can be subject to unintended consequences, both positive and negative (Merton, 1936). The sociological tradition in the new institutionalism understands social interaction as means to either maintain stability or inspire change (Nee, 2001). Governing interactions can be seen as a special type of social interaction that constitute the process of governance and appear as three distinct types: interferences, interplays, and interventions (Kooiman, 2003b, p.25). Thus, interactive governance can be interpreted as a normative approach (a call for increase of cooperation and coordination in steering of societal affairs between and within private and public domains), and as a descriptive approach (an attempt to catch the processual dimension of governance, where societal steering appears as a result of leader-follower interactions, conflicts, exchanges, cooperative efforts etc. between and within public and private, as well as between human and non-human systems). In interactive governance theory, the typology of governance forms (see Section 3.4.1) is defined based on the underlying type of interaction: hierarchical (results in governance-by-government), co-governance (governance-with-government), and self-governance (governance-without government).

The study of interaction between actors is grounded in the adapted theory of action. As already mentioned, assumptions about actors' behavior are inherent to social research and allow both formal analysis (e.g., by means of game theory) and informal modeling (e.g., constructivist narrative). An alternative methodology for studying interactions between individuals and groups is agent-based modeling, which is usually implemented as computer-simulation. In the present research, interactions are reconstructed by tracing the processes through actors' communications, debates, events, asking questions about practices and ways of work in interviews, and extracting instances of interaction (e.g., negotiations, contracts, meetings, cooperation) from publicly available data. The method for this reconstruction is called qualitative content analysis and is described in detail in Section 4.3.3. An important

advantage of this method is that it allows for treating interactions within their respective contexts, placing phenomena in time and space. “Temporal ordering may be a critical element of explanation” (Pierson, 2004, p. 54), since tracing the dynamics of interactions can help to establish which parts of the social world change and which stay the same. Once the variation is established, it can be explained by unpacking how context with its peculiar traits impacts actors’ interactions and choices available to them (or perceived as being available).

3.5 Tracing the process of quality governance through individual studies

The theoretical framework presented above allows the grasping of the complexity of socio-political interaction in addressing shipping quality by focusing on actors who are involved in the process of steering, their strategic interactions, and how institutions structure the interaction within multiple interconnected contexts in which interactions are embedded. The emphasis on polycentricity as inherent to shipping quality governance seeks to overcome the weaknesses of hierarchical ordering of governance practices typical for both one-dimensional and multi-level governance analysis, seeking to bypass the restrictive definition of levels of analysis, and concentrate on embeddedness of quality governance practices instead. The individual empirical studies conducted within the dissertation project do not build upon each other directly, however, they are linked thematically, conceptually, and methodologically. Without addressing the whole field of quality governance in shipping, they provide insights into how successful collective action is coordinated in governance of quality shipping, how multiactor and polycentric arrangements impact the governance process, and what are the generic and specific mechanisms that enable more environmental quality in shipping (Sections 5 and 6). The theory of quality shipping would suggest that everyday inter-organizational exchanges that constitute the larger part of interactions between shipping actors play central role in shipping quality governance. These interactions allow actors to establish mechanisms that link vertical (hierarchical) and horizontal (market and network) dimensions of governance. Formal and informal institutions together constitute a system of rules-in-use, which appear as an outcome of a political process through which actors seek to influence collective decisions to secure their interest, resources, and self-images. The institutionalization of quality shipping is thereby signified by improved coordination between multiple centers of authority exposed to each other in respective natural, politico-administrative, and functional contexts.

METHODOLOGY

4.1 Metatheoretical commitments

Given that different metatheoretical stances lead to different perspectives in theorizing, in what follows the metatheoretical commitments of this research are presented. Their implications for methodology of this study are discussed starting with the problematization of research field and the formulation of research questions, and ending with concrete methods of data collection and analysis. Since epistemological and methodological differences are grounded in fundamental presuppositions about the nature of the world, the ontological position needs to be defined first. Thereafter the epistemology shall be indicated to reflect on forms of knowledge that this research strives to generate. Finally, methodological implications of ontological and epistemological positions will be drawn.

This study adheres to ontological stance of critical realism (Bhaskar, 1978; Collier, 1994; Kurki, 2007), which holds three central beliefs about the world of social phenomena: (1) there is a real (objective) world out there that exists independently from individual thinking; (2) this world is both material and ideational, however matter holds ontological priority; (3) though ideas exist on material foundations and within material constraints, they can change material reality through human behavior. The critical realist position has been significantly influenced by the constructivist critique of positivist social science. Critical realist ontology thereby moves towards a synthesis of the dichotomy between purely materialist position usually ascribed to positivist tradition and purely ideationalist position ascribed to constructivism and other interpretativist humanistic approaches. In other words, critical realism holds that the socially constructed reality is as 'real' as the material one: ideas have fundamental ontological position – they also truly exist and are real and independent from an individual observer's thinking[9].

Epistemologically, the realist view of the social world and its entities can be aligned with a search for maximally explicit and full explanation of the phenomena around us. This stance holds objective truth as existing, though unreachable, and thus ideal state, since knowledge of the real material world may be socially-conditioned and subject to interpretations. Despite the partiality of social scientific explanation, the objectivist view of knowledge assumes appraisal of dualism between the researcher and the subject of investigation. The goal of social scientific exploration is thus to gain some (to the extent of practical possibility) objective knowledge about the causes of social phenomena. The critical realist model of social science seeks to challenge the positivist conception based on the primacy of strict evidence: inherently unobservable social causes, such as ideas and discourses, cannot be dismissed as 'unmeasurable', but have to be included into the social scientific inquiry, based on their ontological plausibility (Kurki, 2007, p.373). As many of the causes cannot be captured other than through conceptual models, any social scientific inquiry will unavoidably be influenced by researcher's critical evaluation, thus, requiring an explicit discussion on positionality.

The focus upon identifying the causes of social phenomena and thereby providing

[9] Tang's comment *"my mental activity is real whether you believe it is real or not"* (2011, p.214) is exemplary in this respect.

rigorous explanation is deeply rooted in the modernist concept of science as a quest for a single truth based on a strictly evidential reference. The empiricist tradition developed as a critique of theoretical philosophy (e.g., Kantian critique) with an attempt to bring a dimension of 'experience', or interaction with the surrounding world, into an abstract philosophical argument. This was the beginning of the modern scientific thinking, in which evidence is viewed as an obligatory building block of explanation and theory as an *a posteriori* product of preferably experimental or otherwise purposefully collected knowledge. However, the empiricist philosophy of science not only emphasizes evidence, but also seeks to establish causal regularities. The metaphysics of causality, a broad topic in itself, shall be briefly addressed here as the search for causal explanation lies at the heart of this research. When deciding what constitutes a convincing causal explanation, the questions of what constitutes a cause and what does it mean to establish causal relation are of ultimate significance. The classical definition of causation dates back to the 18th century, when David Hume defined eight rules for causation in his 1739 book *A treatise of a human nature.* The Humean logic, significantly updated and developed by scholars from J.S. Mill to D. Lewis, essentially views causes as regularities (Chatterjee, 2013). "It assumes that any particular causal event necessarily implies the existence of causal laws that the former is an instantiation of" (Chatterjee, 2013, p. 76). The classical positivist causal position based on Humean logic holds causalities for objective facts inherent to reality. A causal connection understood as a kind of 'law', as a regularity established through studying general patterns, allows for predicting the course of future events. Thus, positivist methods of inquiry and theory-building are appropriated for this goal.

The empiricist take on causality had enormous implications for the development of social science, as it proceeded with the critique of positivist forms of inquiry to develop non-causal forms of theorizing. The social constructivism perspective adhered to an alternative view of causes that does not reduce them to regularities, but rather holds that singular events are more basic than regularities. This singularist position postulates that single cases are as capable of establishing causal relations as large *N* statistical studies, and causality discovered for one case is irrelevant to the credibility of any other causal account (Chatterjee, 2013, p. 86). It also highlights that prior causal knowledge often restricts social inquiry when regularities are seen as basic. This argument was further developed in constructivist social science, which holds that causation occurs in the presence of observers (Weber, 2008, p.60), but does not exist independently from them. The social process of research thereby produces scientific facts, whereas the world is rather collectively invented than collectively discovered.

Yet, Kurki (2007, p.375) argues that the irony of the constructivist project is that by maintaining the anti-causal analysis position, constructivism perpetuates the positivist 'when A, then B' notion of causality. Unlike positivist empiricist causality, which sees the relation between theory and data as unidirectional, but also unlike constructivist anti-causal approaches, critical realism seeks to challenge the dominant conception of causality by engaging with causes as complex and dynamic ontological objects. It occupies a position that any evidence is dependent on the theoretical concepts: data does not 'speak for itself', but knowledge is built through data interpretation as a combination of theoretical presuppositions

and the researcher's subjective position. Yet the importance of interpretative methods based on personal judgment does not make social scientific knowledge relative and accidental: knowledge claims produced within the critical realist tradition can be evaluated "in reference to how convincingly they deal with (plurality of) evidence, explain the process they focus on, reflect on possible biases in their accounts and engage in reasoned argumentation with other accounts" (Kurki, 2007, p.372). The importance of multiple lenses through which data is being filtered before conclusions can be reached makes it difficult for critical realism to accept a possibility of establishing causal regularities, and since complexity is seen as essential to causal explanation, a more pluralistic model of social science is advocated.

A causal notion advocated within the critical realist tradition is in effect the idea of causal mechanism, which can be broadly defined as entities of a causal process that produce the outcomes (Hedström and Ylikoski, 2010, p.50; Tilly, 2001). Searching for mechanisms can be viewed as an attempt to establish how the world works. Particular constellations of particular arrangements will produce certain regularities, and this process is the core of mechanism explanation. Mechanism-based explanation "implies a commitment to the locality of causal process" (Hedström and Ylikoski, 2010 p. 53), thus being incompatible with the regularist ontology of causation. However, it does not abolish the possibility to generalize, but shifts the focus from how similar outcomes will be produced in a different case (statistical generalization) to how similar constellations of social arrangements will play out in a different context (contingent generalization). The notion of causal mechanism is not free from critique from the positivist regularity and the constructivist positionality directions. Positivists expect that once discovered, causal mechanisms can be rigorously tested: if not regularity of causes and effects, than at least regularity of mechanisms. Thereby the 'explanation and prediction' approach inherent to positivist social science is projected upon the approach. On the other hand, the constructivist line of critique pinpoints the impact of the researcher on the regularities that are being discovered and described, questioning both internal and external validity of mechanistic accounts.

Methodological questions can be summarized as choices in regard to the instruments and techniques of solving the research puzzle. In the empiricist tradition, research is seen as an activity consisting of formulating a research question about the phenomena of interest on the basis of previous theoretical knowledge, collecting evidence and analyzing it with a certain method to produce coherent explanation of phenomena of interest, and, finally, updating the theory. The positivist tradition has adapted a dualist approach of separation between a researcher and a research object. This has provoked heavy constructivist critique, which emphasizes that the choice of research topic, formulation of research questions, choice of theories, methods, data, and all analytical tool-kit of a researcher, let alone the interpretation of results and drawing the conclusions, is a matter of subjective choice. The essence of their criticism is that researcher's choices become a part of interpretation process and inherently introduce a subjective bias.

Acknowledging the fact that all scientific knowledge production is inevitably biased and partial, the approach adapted in this thesis accepts social constructivism critique of dualist epistemology, but does not adhere to relativism focusing solely on human subjectivity and

does not deny a possibility of objective knowledge. Critical realism does recognize that knowledge produced in scientific research is influenced by a scholar, however, it prompts itself to engage with empirical research critically, openly discussing the inevitable partiality of an investigation. Besides the good research practices similarly valid for positivist empiricism (transparency, accountability, replicability and the like), critical realism requires reflection on positionality (I discuss my own positionality in this research in Section 1.4). Though biases can emerge from personal, social, political, or cultural experiences, their disclosure and discussion of potential impacts allow taking a critical stance when interpreting the results of empirical investigation, thereby improving the validity of insights gained through investigation methods. Though the realist position acknowledges the impossibility of complete separation between the researcher and the phenomenon of interest, as well as it questions a possibility to conduct a value-free inquiry, dualism and exclusion of non-epistemic values from the scholarship are seen as guidelines.

Following the realist tradition, this research starts with a real-life problem: mitigation of adverse effects of emissions and discharges from shipping (for a more detailed formulation of research question see Section 1.2). Given the nature of the public policy discipline, this real-life problem is framed within the scope of topics considered in social sciences and delimitates the phenomenon of interest as governance of quality shipping, whereas in engineering science the phenomenon of interest may have been technology reducing shipping emissions or innovation in navigational safety, and in economics – externalities of seagoing vessels. It is important to notice, that though the phenomenon of interest is formulated in abstract-theoretical terms (and requires further clarifications regarding the theoretically informed concepts ‘quality shipping’ and ‘governance’, provided in Sections 3.3 and 3.4.1 respectively), it does not contest the ontological status of the problem: polluting emissions and discharges from shipping as well as attempts to minimize them by addressing quality in shipping are held here as objective facts. Once the phenomenon of interest is defined, a research question addressing it can be formulated. Given the epistemological considerations presented above, the research question will seek to establish how the phenomenon of interest is possible, how it comes about, which mechanisms stand behind it. The central research question of this thesis; clarifying how multiple public and private decision-making actors co-exist in the governing of shipping quality in the Baltic Sea, and which mechanisms allow these multiactor arrangements to proliferate and sustain themselves, is therefore a product of its metatheoretical orientation.

Once the research question is formulated, critical realist strategy requires the collection of evidence about the phenomena of interest, which, at the metatheoretical level, requires explicit discussion of what constitutes valid sources of knowledge. Despite the ontological priority of material reality, critical realism assumes that material forces constrain and enable, rather than determine social reality, which consist of both independent phenomena and individual interpretation changing these phenomena. Therefore, in this research data is understood broadly: the world is full of data contained within various materials, including archives, databases, newspaper articles, official documents, interviews, ethnographic notes, conversations, previous research, etc. Having collected empirical evidence of the phenomena

of interest, the researcher can move on to its analysis. It has been often noted, that in reality the processes of data collection and analysis cannot be separated in time and space, and the iterations in this process may be multiple (Gläser and Laudel, 2010). Finally, at all stages of empirical research from data collection and analysis to conclusion drawing, the position of the researcher vis-à-vis the research process is a potential matter of ambiguity. Nevertheless, a researcher shall strive to achieve quality in investigation by applying reliable, transparent, replicable, and verifiable research procedures.

4.2 Linking ontology and methodology: institutions, causal mechanisms and mixed methods research

Metatheoretical commitments such as critical realist ontology and epistemology have direct implications on methodological choices. They dictate conceptions of what constitutes adequate explanation (see Section 4.1) and how this explanation can be produced. They guide research in matters of what constitutes a valid research object (what, who, and where to study?), which specific research techniques are chosen (what are the appropriate methods to study this problem and what kind of data shall be collected?), and how can theory be developed based on the conducted empirical research (what constitutes advancement in scientific knowledge?). In other words, ontologies (including critical realism) dictate what constitutes a valid research strategy to fulfil the research objectives and, at the end, answer the research question(s).

The research question of this project is concerned with the role of polycentricity in quality shipping governance, in particular, how collective action is possible and what is the impact of existence of multiple centers of authority on the emergence and development of governance arrangements. Thus, the core objective of this inquiry is explanation – it seeks to give an account of certain process and social mechanisms generating this process. Given the adopted conception of causality as a process in which the presence of a given mechanism changes the outcome (in comparison to another situation, theoretical prediction or any other point of reference), governance is a process and failures and successes in collective action are outcomes that need to be explored and explained based on exploration of the process and its main features (actors, institutions and contexts). Within approaches to studying the processes of social development and change, new institutionalism is a prominent one. As the logic of inquiry outlined above presents, new institutionalism as an approach that seeks to uncover institutions and their role in structuring social interaction allows for addressing the goals that this research project sets.

Interest in study of institutions can be traced back to the foundational works in 20th century social science research (Weber, 1922; Parsons, 1937; Coase, 1937; Polanyi, 1944; Merton 1949; Homans, 1950). The idea of institutions is rooted within the basic postulates of critical realist ontology: institutions, which function as bearers of social constraints and incentives, are latent structures that have to be uncovered in the process of analysis. In critical realist understanding, the scientific practice of ‘uncovering’ involves conceptualization of the unobservable structures that stand behind the observed processes and events as causal forces. Interaction of multiple causal forces creates complex and dynamic constellations, which

institutionalism seeks to describe and explain.

The proliferation of institutional thinking, in particular new institutionalism, in the 1960s can be seen as a strengthening of post-positivist ontology and revival of the ‘soft components' (e.g., historicism, qualitative method, case-oriented research) in social sciences after the hegemony of the 'hard facts' and 'scientific method' (Backhouse and Fontaine, 2010) emphasized in course of positivist behavioral revolution that thereby attempted to prove the 'scientificness' of social sciences. From the late 1960s the new institutionalism, which broadened the agenda of social research by enlarging the notion of institutions to encompass all types of rules, norms, and strategies that guide human behavior in social interaction, has been one of the leading research traditions in studies on the continuity and change in various dimensions of economic and political life. New institutionalism has been applied to a wide array of topics and types of studies, which gave birth to a famous statement “We are all institutionalists now”, as this tradition gradually informed all domains of political research (Skocpol and Pierson, 2002, p.706). However, one can barely speak of a single unified new institutional theory (Hall and Taylor, 1996); rather new institutionalism denotes a group of approaches that emphasize an idea of institutions as rules of the game that are followed in societal interactions. Importantly, new institutionalism offered fruitful concepts for grasping the counterintuitive for mainstream theorizing features of societal life by focusing the discussion on the distinction between the formal and informal institutions (see Section 3.4.2) and by focusing on spatial conceptualizations by emphasizing the impact of territorial boundaries on the policy process (Carter and Smith, 2008).

The idea of difference between places has penetrated public policy research as new institutionalism proclaimed the importance of spatial and temporal conceptualizations which, in their turn, can be traced by studying the institutions (Bates et al., 1998; Pierson, 2000, 2004; Hedlund, 2011). The institutional tradition emphasized that a solid explanation would engage in revealing the social, political, economic, cultural, and natural traits that provide context for the empirical patterns. That made institutionalism welcomed among the growing body of area studies research, including the discipline of Russian studies, with which this dissertation thematically intersects (Ledeneva, 2006; Sakwa, 2008; Aalto, 2012; Gel’man and Ross, 2013; Oxenstierna and Tynkkynen, 2013). Russian studies literature accumulated significant research insights recognizing that specific institutions may emerge within specific regions and areas, in particular, when explaining the difference between Russian and Western post-industrial economic and social organization. This feature of new institutionalism is further exploited in the present dissertation as it engages with rather detailed treatment of contextual variables.

Agreeing about the fact that institutions matter, however, separate institutional traditions disagree on how and why they matter. Yet, in all classical versions of new institutionalism (rational choice, sociological and historical institutional traditions are usually mentioned as the three mainstream schools of thought, see Hall and Taylor, 1996) institutions are incorporated into research as invisible, but objective forces with a fundamental ontological status: though institutions are not 'hard facts' and seldom can be quantified or even observed, they exist beyond individual cognition and can be studied by means of social

inquiry. In the light of the differences between the mainstream versions on new institutionalism, they have developed own conceptual language reflecting their research interests. Nevertheless, these traditions significantly nourished each other and researchers dealing with real-life problems often borrowed and mixed suitable concepts independent of their origin (such conceptual transfers are possible as the main difference among the three new institutionalisms is methodological, rather than ontological). For instance, the notions of strategic interaction, bounded rationality, path dependency, incremental change, institutional isomorphism, structural embeddedness, initially coming from different types of institutionalism, all assisted in the conceptualization and explanation of the fluid nature of governance. At the same time, all types of institutionalism acknowledge that the interpretation that actors give to institutions has crucial importance, as it allows actors to re-shape and re-interpret existing institutions, and through the behavioral change material reality can be subsequently changed. Therefore, new institutionalism allows introducing ideas as a part of social reality. This dialectics of matter and idea manifested in new institutionalism is inherent to realist ontology, and that is why most of the studies adhering to critical realism are written within the new institutional tradition.

From an epistemological point of view, new institutionalism reflects a distinct view upon theorizing by considering the process of institution emergence and development over time and place as a basis for theory development. From the methodological point of view, the central puzzle to be solved is how to explore the dialectics between institutions (as decision making contexts) and actors (intendedly but limitedly rational and moral decision-makers, see Section 3.4.4 on concept of bounded rationality) given the complexity of the social world and the uniqueness of each given social situation at the same time. This question is much debated and approaches vary between the three new institutionalisms, which developed distinct methodological approaches to this fundamental issue. Rational choice institutionalism is based upon methodological individualism, which assumes priority of individual over collective. Methodological individualism assumes that even if collectives are not a simple sum of individuals, but have additional properties, individual choice still constitutes the basis for analysis. Sociological institutionalism, instead, inherits the sociological tradition of methodological collectivism (holism) and emphasizes that collectives cannot be reduced to a sum of individuals, but constitute independent entities. Methodologically it implies primacy of studying the characteristics of the whole over its parts, thus the crucial role of collective properties for individual behavior and societal outcomes. Finally, the underlying assumptions of historical institutionalism synthesize individualism and collectivism in an attempt to explore how individuals shape collectives and how collective properties, in turn, shape individual preferences.

Historical institutionalism sees explanation as a core business of social inquiry, but the idea of general theory capable of explaining everything is held to be at least naïve. Instead, it emphasizes that in different circumstances different types of arrangements may result in different outcomes. Thus, theorizing is rather an attempt to establish how a phenomenon of interest is possible given its particularities and context. This approach is sometimes referred to as ‘methodological localism’ (Little, 2012) and can be considered as a strong manifestation of

critical realist ontology, as it pays attention to the materialities of the social world. The special role assigned to material objects in investigation of social processes, probably most pronounced in the ANT (see Section 2.1 for further discussion), constitutes one of the main lines of critical realist critique of constructivist account for the role of context in social inquiry. As argued by Kurki and Sinclair (2010), constructivist focus solely on ideational factors results in an incomplete treatment of social structure as it leaves unexplored the role of materially embodied factors (p. 8). Unlike constructivism, historical institutionalism seeks to explore the dialectics of matter and idea by emphasizing the historical and cultural embeddedness of social phenomena.

Yet, historical institutionalism is sensitive to ideational factors. It postulates that any individual is embedded in a set of ideas of appropriateness shared by the members of a certain collective, so that individuals are 'socially situated' in systems of norms and beliefs, which are shaped in interaction with other individuals. Thereby it seeks to uncover the dynamics of social interaction, rather than provide a snapshot of actors and their environment at any given moment. This version of new institutionalism focuses upon understanding continuity and change of social arrangements, tracing emergence and development of institutions, and paying attention to specific, unique and general, common features of these processes (Hall and Taylor, 1996; Levi, 1997, 2004; Thelen, 1999; Bates et al., 2000). It is concerned with the causal mechanisms, which are seen as a combination of actors' interactions and their action context (or 'action situation', see Ostrom, 2011).

The main claim of methodological localism is that social conditions are too complex to allow for any general theory, but when lent to local conditions, a thorough account of social mechanisms that goes beyond individual fact description can be provided. The focus of such analysis is on process, since "causal analysis is inherently sequence analysis" (Thelen, 1999, p.390). Methodological localism regards two dimensions: temporal dimension, which systematically organizes the analysis across the time, and spatial dimension, which organizes it across locations, rather than building the research strictly across instances dimension. Additionally, historical institutionalism adopts the logics of inefficient histories, meaning that in social life suboptimal results are often a result of a dead-lock or path-dependency, rather than of deliberate determination and rational choice.

In order to align the special focus of historical institutionalism with the broader logic of institutional analysis, the set of methods used in research must be aligned to the nature of causality the study strives to discover (Hall, 2003). Unlike approaches that seek to discover regularities and provide macro-level explanation, this research turns to micro-level foundations of larger processes. Aiming at reconstruction of smaller processes that contribute to large tendencies in the society and evaluation small-scale explanations requires using diverse data. An ontological shift away from positivism is developed in interaction with constructivist critique of the ontological picture of the social world upheld in positivist science, and also suggests that methodologically social research should move on to abandon the Humean conception of causation. In particular complex causality can be promoted by finding fruitful ways to explore multiple methods of data collection and analysis integrated within a single research project. The synthetic assumptions made in historical institutionalism

(matter+ideas, individual+collective, conflict+cooperation) make it open to a spectrum of analytical frameworks ranging from induction to deduction, from qualitative to quantitative, from interpretative narrative to formal modeling. In a way, the broadness of the institutional approach and the inherently invisible character of institutions suggest that they are not easy to explore and that methods may be deployed on an *ad hoc* basis depending on available material and the nature of the problem. As a result, mixed method research (MMR) is argued here to be the most suitable way of pursuing analysis within the framework of new institutionalism.

The advocates of MMR claim that it offers a way to overcome the weaknesses inherent in any method taken alone (Collier and Elman, 2008; Della Porta and Keating, 2008). The critiques of MMR are rather concerned with the coherency of such approach and, consequently, its capability to add value to social scientific inquiry (on limitations of MMR see Section 4.4). Most common is a discussion about qualitative and quantitative research strategies as two camps with two separate ontologies and epistemologies, where qualitative is assigned to interpretativist and quantitative to positivist tradition. However, recent literature has questioned the divide between qualitative and quantitative methods, especially arguments that highlight how old discussions were narrow and inconsistent, flourished within literature on MMR (Tarrow, 1995; Adcock, 2001; Patton, 2002; Mahoney and Goertz, 2006; Brady and Collier, 2010).

The central point of the MMR argument is that qualitative and quantitative methods of data collection and analysis do not represent distinct epistemologies, and even though quantitative methods are more widely used in positivist, and qualitative in interpretativist research, nothing precludes quantitative data from being used in interpretative inquiry and qualitative data to support a positivist strategy (Lieberman, 2005; Fielding, 2010; Frels and Onwuegbuzie, 2013). Thus, two types of research do not as such demarcate different conceptions of knowledge; rather, they represent different tools consistent with either tradition. In the light of this argument, several logics justify mixing different types of data and analysis within a single research project. One is triangulation, which means that different types of data are collected to verify the findings derived from one by cross-checking with the other (Jick, 1979; Denzin, 2012). The main critique of triangulation is that different types of data are inherently prone to produce different types of knowledge, therefore comparability cannot always be achieved. Another logic is complementarity, which means that different types of data are capable of compensating for the weaknesses of the other. It builds upon the critique of triangulation. Acknowledging that any given type of data can produce only a given type of knowledge, it turns this from a weakness into a benefit, by taking a pragmatic approach to knowledge production and "prioritizing the fact of discovery over the justification for knowledge" (Small, 2011, p.62). This research adheres to the logic of complementarity: individual studies are based on a variety of materials and analyzed with different methods, yet, their results are seen as compatible 'bits and pieces' contributing to exploration of the overarching research question.

Summing up, the mixed methods approach in this research project, which means that different methods are used both for collecting and for analyzing the data, stem from the

ontological position adapted in this research and the governing conception of causality. This research focuses on causal explanation of processes, aiming to investigate why certain processes occurred, how they were possible, which drivers stood behind them. The methodological localism approach adopted in this dissertation moves from a search for covering laws as regularities to context-sensitive qualitative inquiries. It aims to explore how the set of possibilities for future action that is taken into consideration affects social outcomes, given the specifics of time and place where social interaction occurred. A theory developed here is contextually embedded, yet generalizable at the mechanism level, granting the considerations of unique and general methodological centrality.

4.3 Methods of data collection and analysis

A methodological solution to explaining how processes in social life are linked with each other and with the outcomes of interest can be based on the study of ongoing social dynamics. Though in reality social processes do not have any clear-cut beginning or end, nor do they have strict spatial borders, for research purposes data collected for a certain project denotes a starting and an ending point, as well as provides a project with spatial delimitation depending on the chosen angle of observation. In order to account for this inevitably constraining and simplifying, yet necessary delimitation of time and space, the contexts in which social mechanisms are rooted shall be reconstructed (see also Section 2.1). The notion of context can be used to explore and explain how social phenomena, including matters of collective action and governance central to this thesis, may have a variety of forms, modifications, and solutions depending on when and how they emerged. Yet, using only one type of data may not be sufficient in order to explore both processes and the respective contexts in their complexity. This consideration served as a driver for using different types of data, which, in their turn, may require different treatment. Though there are techniques of crossover analysis (i.e., when quantitative techniques are applied to qualitative data and vice versa, Small, 2011, p.72), those are not mainstream techniques and are not always applicable, especially given a limited reach of qualitative exploration of large numeric samples. Therefore, this study adopts a broad perspective on data collection and analysis techniques, using them in a mixed manner.

4.3.1 What is data? A broad perspective

The world is full of data and the social world is an unquenchable source of data on social phenomena. Numbers, words, pictures and videos, media, social media, documents, previous research, observations, research interviews, all constitute data potentially interesting for analysis. Traditionally in social research, data has been generated for a specific research project by setting interviews, questionnaires, surveys, conducting observations etc. However, the broadening of information space, especially the internet and social media, has challenged traditional practices. Just as in historical research, where data is not generated for a concrete investigation, but researcher's task is to access already existing sources (archival research), contemporary social science can take advantage of a large variety of data already generated (desktop research). Thus, if a broad view of data is adapted, problems of lack of data might seldom occur. Rather, the problem of difficulties in aligning different types of data and

making sense of it challenges social science researchers.

4.3.2 Data collection

This thesis holds a belief that everything starts from data: its availability, quality, collection, storage, usage, handling, interpretation, and visualization. Data is the root of explanation, the beginning of making sense of the world, and knowledge production. However, given the variety of data available, in a research process data is rather a starting point for pondering theoretical issues, since only the presence of a theory can shape a research project and help to make data collection and analyses processes manageable. In this research the theoretical focus was on governance and collective action; that is why when collecting data for this project attention has been given primarily to actors, their actions and interaction. Since the data that can shed light upon the issues of interest is diverse in nature, different methods were used.

Two main methods of data collection were used in this research: (a) archival method (desktop research); (b) fieldwork (interviewing, observation, and personal communication). The first method was used in all studies, whereas the second in Articles I and IV (interviews) and Article III (observation). The archival method, the main method in historical research, aims at constructing a coherent account of an event or a process, taking into consideration primarily all the factual evidence that can be found in relation to the subject of investigation. A distinctive feature of the archival method is its reliance on primary documentary sources in comparison to secondary sources or empirical research ("the document is a point of departure" advocated Langlois and Seignobos in their 1898 volume, quoted in Franzosi, 2004, p. 167). Desktop (internet) research can be seen as a type of archival research when the subject of investigation is contemporary (nowadays many documents can be found online, including legal documents, open letters, agreements, press releases, stakeholder communications, presentations from seminars and conferences and other relevant sources of primary information) or when digital archives are used. Additionally quantitative numerical data can be accessed through the internet, as many public and private institutions are following the open access policy and make their databases and statistical information available. In this research THETIS database provided by European Maritime Safety Agency (EMSA) was used as a main source of data for Article II, HELCOM reports on accidents and vessel-induced pollution assisted in Article IV and in Section 2.3, as well as AIS (automatic identification system) data derived from Marinetraffic.com served as an extra source in Articles III and IV and Section 2.3.

Fieldwork differs from archival research in a way that this is a way of producing data, rather than collecting available information. Along with desktop data collection, interviewing has been one of the leading methods for this research. Interviewing is a method based on an assumption that the meaningful and knowable perspective of people involved in social situations can make explicit things that cannot be directly observed (Patton, 2005). Expert interview is however a contested method; much critique is exercised regarding its high degree of sensitivity to context, where choice of interviewees, questions for the interview, as well as interpretation of the obtained information are solely the researcher's choices and difficult to justify by strict reasons, as the interviewing process is often guided by 'research intuition'

(Janesick, 2001).The second field method used throughout the whole research process is observation. This was mainly conducted at key events (conferences, meetings, seminars) in the BSR, where I participated and observed presentations and debates relevant for the topics studied. Information acquired from these events allowed for the acquiring of first-hand insights into the field and was used for clarification purposes.

'Experts' here are defined as "people who possess special knowledge of social phenomena" (Gläser and Laudel, 2010, p.11). Two types of expert interviewing can be distinguished on the basis of their main goal: (1) getting information or technical clarification ('experts as interviewees') and (2) getting expert opinion ('interviewees as experts'). The first type is realized by interviewing people in a special field of knowledge in which a researcher may be less informed and information is very technical or scarcely available, so that an interview is one possibility to get familiar with the subject-matter. In shipping research, which concerns itself with a rather technical and specific field of activity, especially in matters related to the development of shipping technology, this type of expert interview can be helpful. The second goal is usually pursued parallel with the first one. In the second type of interviewing the focus shifts from acquisition of specific information to getting an opinion about one issue or another. These two dimensions of expert interviewing reflect differences in epistemology between positivist and constructivist approaches. The critical realism adopted in this study holds an intermediate position and considers that interviews bring both 'objective information/facts' and 'personal theories', which must be considered when analyzing and interpreting the interview statements. Here the responsibility of a researcher is to select experts and procedures (questions, interview guide) that will allow this distinction.

The quality of the information obtained during an interview is dependent on the quality of both interviewee and interviewer. The interviewer is expected to be well-prepared for the interview (Berry, 2002; Liebold and Trinczek, 2009), including preliminary collection of information on the subject, preparing an interview guide, formatting and phrasing the questions in an open, clear and non-leading manner (Seidman, 2005), as well as exercising 'active listening' (McCormack, 2004) or 'the art of hearing' (Rubin and Rubin, 2012) during the interview. Regarding the 'quality' of the interviewee, the interviewer needs to ensure that an interviewee is familiar with the social setting in question, is willing to offer his/her reconstruction of this setting, possess information about the social processes in question, and thus be capable and willing to serve as a source of information about the part of social reality that the researcher seeks to explain (Gläser and Laudel, 2010).

The selection of interviewees for the empirical studies featuring this dissertation made use of the snowball method – after some experts that were identified as 'key persons' in a certain domain based on publicly available information were interviewed, they were asked for further contacts (Tansey, 2007). Yet, the snowball method is not without its drawbacks. Its major shortcoming is the oversampling of personal networks (Heckathorn, 1997, p. 175). Since the initial selection of experts is not random, the first interviewees may point to other experts from their networks, which would supply experts with similar viewpoints, thus leading to an illusion of saturation. To account for this limitation, additional viewpoints can

be attempted through literature and media review. Once experts are found and agree to participate in an interview, an interview guide should be developed.

In this project two interview guides were used, where the second was an updated and tailor-cut version of the first one. The general structure was made of ca. 10 main topics, starting with a 'warming-up' question in the sense of appreciative inquiry (Michael, 2005), whereas the sensitive questions were spared for the later part of the interview. Interviews took on average 45 minutes to one hour and were conducted in Russian and English, recorded (with exception of interviewee opposing recording), transcribed in full length, and sent to the interviewees for verification. The main topics concerned the patterns of Baltic transportation, quality management, regulation, policy learning, relationships between public and private actors, and impact of natural and politico-administrative features of the Baltic Sea region upon oil transportation.

Finally, the number of interviews is a sensitive matter and it is for the researcher conducting qualitative investigation to decide on the sufficient number of interviews so as not to engage into spending excessive amounts of time and resources, but yet to provide due diligent piece of research. The general 'rule of thumb' in respect to the amount of interviews needed for a project is the point of saturation: one should keep asking as long as answers differ, once no new information is acquired, the point of saturation is assumed to be reached. The basic idea is to establish the range of responses to the questions posed. This brings us back to matters of selection of people and topics, discussed above. The number of interviews in this project is comparatively modest, which is explained by the role assigned to the interviews in this project in terms of data analysis. In this research, information received through desktop study was complex, so in order to facilitate its analysis and ensure the accuracy of interpretation, semi-structured expert interviews were conducted. Interviews were used in order to facilitate interpretation of results derived from a larger sample of qualitative data, clarify technical questions, as well as test the agreement upon the key elements of the research model.

4.3.3 Data analysis

A study of complex social processes is usually divided into sub-studies of smaller events and processes, which are being investigated in more detail. These sub-studies might differ in their objective (exploratory or explanatory), type (qualitative or quantitative), in the amount and quality of material available on their account. As advocated in Section 4.2, the method of analysis applied in each of the sub-studies shall be chosen in accordance with the research objectives. The application of different methods in this research was motivated by pursuit of different research questions corresponding to different research objectives (background-setting, hypothesis development and hypothesis-testing), as well as by the characteristics of the data in each specific setting. The first task, setting background, requires consideration and systematization of a large number of documents and observations. On the basis of this analysis, a hypotheses can be developed and research models established. Finally, at the stage of hypotheses-testing, methods that allow the bringing together of theory and empirical part are required. The methods used in this research are thematic and historical contextualization,

qualitative content analysis, and correspondence analysis.

a) Thematic and historical contextualization

Thematic analysis usually constitutes the initial phase of any qualitative data analysis, since it looks across all the data to identify the main themes that can be found with regard to phenomena of interest. At this stage, the researcher establishes the context of the phenomena under scrutiny. The main analytical task and decision to be made is what constitutes the phenomenon and what is the background surrounding social phenomena, but distinct from a phenomenon itself. In reality, this preliminary analysis mostly takes place at the same time as data collection. Contextual analysis often takes the form of historical analysis, "commonly used in social research as an introductory strategy for establishing a context or background against which a substantive contemporary study may be set" (Gardner, 2006, p.135). This analysis draws attention to actors, events, time, place, frameworks, encompassing everything what the theory suggest is valid for analysis. Though initial contextualization is exploratory, inductive, and requires open-minded approach to data, theory is equally important in creating a contextual account, since the "sequence of events are thus generated by a set of theoretical commitments, rather than by the putatively innate character of reality itself" (Jackson, 2006, p. 494). All individual articles of this dissertation include a thematic and contextual analysis part, although the follow-up strategies differ. One way of building upon thematic and contextual analysis is to proceed with 'concept formation', a second stage based on assessing the topics arising within the primary analysis in the light of theoretical presuppositions. This analysis is well-suited for the goal of hypothesis-development. Additionally, on the basis of primary thematic and contextual analysis, other methods can be applied to test theoretical models. In this project I applied two distinct analytical methods: qualitative comparative analysis and correspondence analysis.

b) Correspondence analysis

In the family of quantitative methods, correspondence analysis (CA), together with, for instance, factor and cluster analysis, belongs to the group of multivariate methods (MVM), meaning that it allows the simultaneous consideration of more than one outcome variable. Since multivariate techniques are used when more than one dependent variable is in question, they enable understanding of the relationship between variables, as well as their unique and aggregated relationship to the problem under scrutiny. MVMs can be used as both confirmatory and exploratory techniques; and they give a broad array of opportunities for efficient data-mining, data reduction, and visual representation.

Correspondence analysis is an exploratory data analytic technique designed to analyze and visualize tabular information that contains some measure of correspondence between the rows and columns. As opposed to traditional hypothesis testing of the design of empirical investigations, CA is used to identify systematic relations between variables. CA is typically used to explore and reveal patterns in the data in order to generate hypotheses for further statistical analyses or in-depth qualitative investigation. For this purpose, CA is marked by several advantages. First, it allows for simultaneous consideration of multiple categorical

variables. Additionally, it provides simplification of the initial data and its detailed description with minimal losses of information. Moreover, CA enables graphical display of row and column points in biplots, where row and column geometries have similar interpretations, facilitating analysis and the detection of relationships. Finally, CA has highly flexible data requirements. Similarly with cross-tabulations, there are no assumptions of scales or distributions of variables. Hence nominal scale variables can also be analyzed (Greenacre, 2010). Eventually, CA shows how the variables and their categories are associated, not only that an association between the variables exists, which is the case in chi-square tests of pairwise cross-tabulations.

In Article II, CA is applied to a relatively large dataset (N=8139) acquired from the Hybrid European Targeting and Inspection System (THETIS) hosted by the EMSA website. Whereas on the basis of extensive literature review it has become clear that some vessels perform better than others quality-wise and their performance is far from being random, qualitative empirical research did not allow one to generate hypothesis about the criterion (or group of criteria), according to which quality pioneers can be distinguished from quality-laggards. Use of MVM has appeared as a possibility to gain understanding of the patterns of operational performance in the Baltic Sea transportation. The flexibility of data requirements defined the choice of CA as opposed to other tests for examining the associations of categorical variables, since the data set derived from THESIS contained both nominal scale and non-normally distributed variables. A multivariate analysis helped to address the question of which characteristics of a vessel correspond to a profile of a quality performance vessel. The selection of variables was motivated both by pervious research and parameters of the dataset. However, what is missing from CA is the question of whether the variables considered in the analysis are actually necessary and sufficient for quality in shipping operation. Association of certain variables cannot be considered as equal to exhaustive understanding of the phenomena. The major limitation of CA is that the selection of variables and their categories is subjective, thus it might appear somewhat arbitrary in a strictly positivist world of inquiry. It remains a matter of thorough preliminary research to gain assurance that the relevant dimensions are included in the analysis (Hair, 1995). Of course, the old rule ‘correlation does not imply causation’ applies similarly with CA, as the causational interpretations of the directions of the relations must be based on the substantive reasoning and not on statistical findings alone. This is why an in-depth qualitative analysis can be particularly valuable in combination with CA. The result of Article II, a superior quality of operation of tankers in comparison to other types of vessels, has offered a solid basis for the investigation of oil transportation quality, conducted in Article IV.

c) Qualitative content analysis

Qualitative content analysis was suggested as an alternative to coding, the most widespread method of qualitative data analysis, with a goal to provide stronger reduction and structuration of the data material during the initial stage of analysis (Gläser and Laudel, 2010). The central idea of this method is to extract information from a text and to process it independently of the text. Qualitative content analysis is theory-guided and requires a choice of analytical

categories in advance, at the same time, it is sensitive to data content and stays opened to new concepts emerging from the data.

Technically, this method of analysis consists of the two distinct steps: data compression and pattern recognition. Whereas the techniques used during the second step, the search and integration of patterns, are familiar from other qualitative analytical methods, the first step offers principal innovations. The systematical data reduction process used in qualitative content analysis allows the linking of raw data to the research question by identifying, locating, and structuring raw data with the help of so-called extraction tables. Essentially, the data collected for analysis is compressed in a tabular form in accordance with categories that can be viewed as 'containers' for meanings, deductively derived from the theory. Though the extraction process is theory-guided, it remains open to the new concepts emerging from the data. The dimensions of potential interaction to be explored are the subject of interaction with the nature of the situation and the scope of the included actors. In the extraction tables, information is summarized for theoretical reasons, so that the background cases (units of observation) are left in the background, whereas the information is preserved. Information with the same meaning is aggregated, whereas contradictory information is kept for further in-depth investigation. Thus, single units of analysis are aggregated into larger units (referred to as variables or categories) at a more abstract-theoretical level, which allows subsequent analysis. The main difference between qualitative content analysis and coding is that the latter applies categories (codes) to text and the outcome of the first analytical step is thus indexed text, whereas the former focuses on content extraction, and the outcome is indexed content. Thereby, qualitative content analysis attempts to resolve one of the major drawbacks of coding, an overload of codes and an overload of texts (Gläser and Laudel, 2010).

The second step of qualitative content analysis is analysis of extracted information. At this step the original text has been already left behind and a researcher is processing information separately from the text, paying attention to patterns that occur in the data. Pattern recognition builds upon: (1) sequences of events that occur more than once; (2) combinations of conditions, processes, or outcomes that occur more than once; (3) conflicting accounts of events or processes. Once patterns are identified, typologies can be built by combining all patterns that can be merged into types of patterns. All the data that does not fall under any of the identified patterns has to be scrutinized to provide an explanation. Finally, conclusions can be drawn in form of "contingent generalizations" (Gläser and Laudel, 2010). "Contingent" here means that generalization is bound to the initial conditions, so that a pattern is not said to exist in any situation, but for a certain type of a process it is claimed to operate and produce a certain outcome.

In this dissertation Articles III and IV use the method of qualitative content analysis to analyze qualitative mixed data. The primary aim of the analysis was to look for mechanisms that can account for observed processes, and to clarify if the theoretical propositions concerning governance and collective action are mirrored in the empirical data. In both cases, analysis was guided by a theoretical research model, which served as a source of initial categories. Special attention was paid to operationalization of theoretical concepts, which was performed coherently for both analyses in order to ensure compatible research outcomes. The

general line of inquiry was similar in Articles III and IV, their outcomes describe mechanisms at work in delivering environmental quality in shipping; additionally, both studies emphasize the role of polycentricity by exploring multiple contexts in which the process of quality governance unfolds.

The method of qualitative content analysis has several advantages in solving research puzzles raised in these studies. Firstly, it is deductive in nature, which allows the utilizing of existing theoretical concepts, rather than generating ad-hoc case-specific vocabulary. Secondly, this method does not require hypothesis-testing design, which makes it open to emerging themes and allows the incorporation of new insights, thereby advancing the existing conceptual schemes provided by the theory. Moreover, this method is well-suited for the development of visual displays, which enhance both data reduction and conclusion drawing and verification (Onwuegbuzie and Dickinson, 2008, p.207). Among the central limitations of the analytical strategy used in Articles III and IV is the operationalization of the central concepts and their treatment in a rather simplistic research model. In the actual social process, all the dimensions of governance are interconnected and influence each other so that the causes and effects are often difficult to distinguish. Thus no tools are provided for recognizing the direction of causality and the actor-structure problem remains unresolved so that the statements delivered by the analysis are vulnerable to critique. As no formal robustness tests are possible in qualitative research, only further research and additional evidence can strengthen the inquiry. Another critique of the method follows from constructivist perspective and addresses the way original text is treated in qualitative content analysis. Since the data is being separated from original text for further analysis, “the application of qualitative content analysis presupposes that it is only important what was said, not how it was said” (Gläser and Laudel, 1999, p.5), which contradicts to the basics of constructivist epistemology. Yet, treatment of data as information is consistent with the ontological underpinnings supplied by critical realism. In order to align ontology and methodology in post-positivist qualitative research, a researcher needs to consider that 'personal theories' contained in the data are intertwined with factual information, thus, textual data needs to be treated critically.

d) Software

Two software programs were mainly used: MIA (software on the basis of MS Word developed by Grit Laudel specifically for qualitative content analysis, http://www.laudel.info/mia/) and Survo (with the kind assistance of Kimmo Vehkalahti) for statistical analysis.

4.4 Limitations and potential shortcomings

Positivist empiricism considers research to be an objective process of knowledge creation, in which theories that explain causal regularities are derived on the basis of empirical investigation. Interpretativist constructivism disagrees with this position on all subjects: research is not objective, but a subjective process, in which personal experiences perceptions of an individual research in interaction with their observations and subjectively-selected questions, data and methods construct their theory of a phenomenon in question, which eventually is a partial, subjective interpretation of this phenomenon. Critical realism in its turn

occupies a middle-ground between the two views on the nature of social research. Acknowledging the limitations stemming from research setting as such (influence of individual researcher's choices regarding method, data, analytical strategy etc.), critical realist inquiry brings the question of quality standards for social research high on its agenda.

Among quality criteria in social research, reliability and validity are the most discussed, as they express the confidence that can be placed in the results of investigation (Whittemore et al., 2001; Berry, 2002; Maravic, 2012, p.161). Reliability is usually interpreted as the extent to which an analytic procedure yields the same answer whenever it is carried out, whereas validity is the extent to which the given answer captures what the research wished to capture (Bailey, 2008). Often a distinction between internal (causal relationships within the data) and external (generalizability outside the concrete study) validity is made (Webb et al., 1966). Several criteria can be added to these two central measures of 'objectivity', or struggle to describe and explain a world of empirical reality 'out there'. Glaser and Strauss (2009) emphasize a close fit to data, conceptual density, explanatory power, and durability over time as quality practices in qualitative research, Charmaz (2006) pinpoints originality (research goes beyond 'common knowledge') and usefulness (the results can be practically used or applied), Lincoln and Guba (1985) agree that credibility, or how believable the findings are in a given context, and transferability, or how findings may assist when studying other time and place, as well as conformability, or the influence of researcher's non-epistemic values. Finally, among methodological criteria, authenticity, transparency, and inclusion shall guarantee that none of the contradictory data was excluded from the research and all analytical procedures were transparent and can be followed from data collection to conclusion drawing (Miles and Hubermann, 1994; Elo et al., 2014). It is important to keep the quality criteria in mind, since qualitative research is by default a compound and complex procedure full of challenging contradictions. The quality criteria described above serve an important goal of avoiding or at least minimizing bias in the research process.

Researchers agree that bias is unacceptable, as they also agree that bias is unavoidable. The impossibility of a neutral outsider position has been emphasized by referring to it as a 'view from nowhere' (Nagel, 1989). All researchers are positioned by their background (age, gender, nationality, personal history, etc.), the conditions under which they were trained and institutions in which they work, and even by journals and other outlets in which they publish. One of the accepted ways of minimizing bias is an explicit discussion of researcher's positionality vis-a-vis their research (Section 1.4). Whereas in ethnographic studies writing about positionality is an obligatory part of research strategy, in political science it is often left out completely. Yet, discussion of non-epistemic values as a derivative of researcher's personal background can be seen as beneficial for any type of social scientific investigation, and shall be added to quality standards mentioned above (Kurki, 2007, p.374).

This research aimed at creating a coherent and self-reflexive account by ensuring that in the discussion of empirical findings vis-à-vis empirical research questions of the whole thesis, the questions of quality, trustworthiness, and authenticity are addressed through: (1) transparency regarding the process of data collection, processing, transformation, and display

(internal documentation, writing of memos with a careful description of procedures, storage of original data and making it available on request); (2) presentation of possible biases, positionality, uncertainties (to be found in individual articles as well as in Sections 1.4 and 4.2); (3) consideration of competing hypotheses, rival conclusions, negative evidence (to be found in discussion on limitations in individual articles); (4) clear formulation of research questions, aims and goals (to be found in the introductions of individual articles as well as in Section 1.2); (5) systematic treatment of concepts with explicit reference to prior and emerging theory (to be found in the theoretical sections of individual articles as well as in Section 3.4); (6) definition of the scope and boundaries of research conducted, identification of limitations to generalizability and applicability (to be found in the discussion sections of individual articles as well as in Section 6); (7) making findings action-oriented (e.g., policy recommendations) and accessible to potential users (to be found in Section 7.2 as well as in media work and public talks given by the author). However, not all of these criteria were fully applied in each of the individual studies, in particular, reflexivity with regards to non-epistemic values and ideology has not been integrated into peer-reviewed articles, for which this introduction seeks to account.

Finally, I shall make a comment on the critique of mixed method research and limitations of MMR as a research strategy. On the one hand, MMR is trying to get 'the best of two worlds', adjusting methods of data collection and analysis in accordance with research needs, rather than adjusting the research process in accordance with chosen method. One criticism here is that whereas we have quality standards for conducting both qualitative and quantitative research, there are no commonly agreed standards for mixing methods. As long as this question has not been resolved, the recommendation is to use transparency and authenticity. Since MMR is not method-driven, but case-based, it seeks to find an optimal strategy to deal with each phenomenon – which is in line with position of critical realism that serves the research objectives, seeks to produce explanation recognizing the complexity of social phenomena and employing interpretative approach. And this 'personalized' approach can be seen as its main weakness, too, since using different measurements and constructs to study the same thing risks undermining internal validity. Are different methods compatible and do different strategies essentially grasp the same thing? How can MMR ensure that key concepts, variables, and mechanisms can be translated and compared? This is only possible if approaches used are based on similar ontologies and share conception of causality. For this reason I introduced a lengthy discussion in Section 4.2, proving that reliance on multiple methods adapted in this research is sensitive to this matter and that differences between the methods and their applications do not have ontological implications. The second generally-exercised criticism is a 'technical specialization' among researchers and refers to the difficulty of being a 'Jack of all trades'. This means that in today's social sciences research methods used may be quite complex and need special training, which requires a broad practice not to appear being a 'master of none'. In this research I was assisted by a specialist in statistics to read the correspondence analysis correctly, whereas in qualitative content analysis I relied on my own knowledge and training in data analysis techniques. Yet again, quality standards should be followed independent of which analytical procedure is being applied.

INDIVIDUAL STUDIES

Shipping is a collective undertaking, which requires collaboration of shipping companies, ports, cargo-owners and authorities, to name just a few actors directly involved in any maritime transportation activity. Prospects for collective action in the maritime domain are seldom investigated, though the transboundary and globalized nature of shipping, where no single actor can provide for quality governance on their own, constitutes a case in point. The individual studies presented below focus on different aspects, instances, and constellations of the shipping quality governance in the Baltic Sea. They are unified through their interest in scrutinizing collective attempts to solve issues of mutual/communal importance, including shipping safety and environmental quality. Articles I and II explore shipping quality governance as a multileveled and polycentric process, paying attention to intersections of multiple areas as contexts for collective action efforts. Articles III and IV look into particularities of interaction between maritime actors' groups at different levels and scales through a more detailed investigation of two contemporary environmental questions connected to shipping: pollution hazards in oil transportation and air emissions from ships.

The inductively inspired empirical research explains the approach to theorizing and theory-development in this research: all studies started rather from a research intuition ('there seems to be something curious there'), rather than from formulating a clear-cut hypothesis in an attempt to (dis)prove a certain theoretical proposition. Yet, the ontological and epistemological choices of the research project, as well as the central theoretical concepts inherently rooted in the project's metatheoretical commitments, granted it internal coherency and allowed the combining of diverse research intuitions emerging within the individual empirical studies when drawing the overall conclusions. At the same time, individual studies do not fully share the vocabulary, e.g., concept of 'quality shipping' has overridden the 'clean shipping' used at the early stages of research (see Section 3.2), a positive notion of 'shipping quality governance' was eventually favored over 'governance of shipping externalities' (see Section 3.3), and 'actors' was applied as a generic terms instead of the distinction between 'actors' and 'stakeholders' (see Section 3.4.3). The search for a set of concepts necessary and sufficient to elaborate the research question and contribute to existing theoretical knowledge was one of the central challenges during the whole research process. This challenge is far from being new or related to any particular methodological choices, as since medieval times coherent treatment of the problem referred to as Occam's razor ("entities must not be multiplied beyond necessity") was associated with good research practices.

The principle feature of the analytical framework developed in this study is contextual sensitivity: the four studies share 'methodological localism', placing governance of quality in the globalized shipping industry within the time-space of the contemporary Baltic Sea region. The strategy of contextualized inquiry sensitive to multiactor and polycentric patterns of order in maritime governance seemed to bring a fruitful start and offered interesting results with regard to governance in the context of oil transportation and air emissions reduction. Though empirical research could have been continued to cover other topics, it was not the aim of this research to make a complete account of all governance interactions and constellations aimed

at quality in shipping. Rather, the aim was to provide insight into how collective action in shipping is possible and how heterogeneous actors in maritime transport managed to improve shipping quality by engaging in contextually-bound institutional development. In the light of these research ambitions of this study, the collected insights were sufficient to provide (at least, partial) explanation of the central questions and document the role of polycentricity. In what follows the four individual studies are described separately, pinpointing for each article: (1) research questions and aims; (2) thematic and empirical scope; (3) main findings and empirical contributions; (4) research intuitions awakened by the study (implications for subsequent articles); (5) contribution to the overall research aims and goals of the dissertation project.

5.1 The Russian Dimension of Baltic Maritime Governance

The initial research plan of the dissertation was treating collective action at the macro level, which informed the first empirical study presented in Article I. Setting the research questions within the framework of EU-Russia relations, this paper acknowledges collective action problems in governance of shipping environmental externalities and assumes intergovernmental collaboration to have central importance in solving collective action problems. The study thus aimed at exploring the impact of EU-Russia relations on how maritime transport quality is realized in the Baltic Sea. In particular, it sought to trace the temporal development of Baltic maritime governance over the last two decades as an interaction of two interdependent governing processes led by Russia and the EU.

The maritime governance that exists at different levels (including international, regional, national, and local levels) is even more complex in the BSR due to existence of additional supranational level, the EU governance, which after the 2005 enlargement included all the Baltic littoral states except Russia. The prevalence of EU member states in the BSR shall be seen in relation to the EU's ambitions to act as a leader in regional governance, and EU's attempts to address shipping externalities in the Baltic Sea and make the Baltic "a model region for clean shipping" (EU BSRS, 2009). However, the EU level is clearly not the only level at which the problem of shipping externalities is addressed. Whereas Russia is not a part of the EU, its share in Baltic trade, and its interest in being connected through the Baltic Sea as a sea transport corridor (in particular, for energy resources) is significant. An exploration of the Baltic Sea as an arena where the EU and Russia put forward their approaches to maritime affairs (though, constrained by the international and regional legal architecture) defines the scope of investigation in Article I.

A significant part of the Article I discusses the administrative, legal, economic and security aspects of the contemporary Russian maritime policy (after the USSR until the 2010s). The absence of comprehensive analysis on the subject was the main motivation for focusing empirical data collection and analysis on the data that allowed reconstructing the process and explicating institutionalization of governance practices within the Russian maritime sector. The study shows that after the collapse of the Soviet Union, Russian maritime policy in the Baltic Sea region developed along the lines of Russian foreign policy. Showing that shipping is seen as a strategic policy area, and as a way to realize economic and

foreign policy ambitions, the paper claims that openings for the proliferation of new norms, such as quality shipping, are tightly connected to broader interests, and in the BSR Russia's EU politics has a significant role to play. In particular, since the Baltic Sea has become Russia's most significant oil outlet for the EU countries, the energy relations between the EU and Russia account for patterns in maritime transportation.

The analysis also highlights a certain mismatch in approaches to dealing with maritime issues, which is rooted in a principal difference between a supranational governance by the EU, which supports shift of roles and responsibilities to wider range of stakeholders and seeks for more interactive form of addressing issues in shipping, and a hierarchical governance by the Russian federal government, which locates maritime affairs in the sovereign domain closely linked to foreign policy. The political dialogue between the EU and Russia in matters other than maritime transport (and it should be noted that in this matter their cooperation is rather limited) appears to be crucial for the emergence and development of transboundary institutions for quality shipping in the BSR. The good examples of cooperation in navigational safety, measurement of air emissions, and accident response, mostly come as package deals bundled together with other issues.

The completion of the first empirical study was influential for the course of development of the whole dissertational research. Firstly, it pointed out that more attention in subsequent studies should be paid to the functionality of shipping activities, involving a broad range of actors (e.g., ports, shipping companies, local authorities) and scrutinizing their role in quality governance through individual practices and inter-organizational exchanges. Secondly, the findings of this study placed Baltic maritime governance within a politico-administrative context affected not only by global regulatory trends, but also by the regional EU-Russia relations, including trade and cooperation/coordination in matters of maritime safety, security, and environmental protection. The relevance of this study was dictated by the absence of analysis of politico-administrative and functional areas against each other (complementing/conflicting strategies at the 'high level' and their meaning for quality shipping as a set of practices). This study opened a number of perspectives for further research, among the most interesting I found the increasing amount of maritime trade in oil and oil products between Russia and the EU and the emergence of governance mechanisms in this area (Article IV) and on the role of ports in tackling the environmental impacts from shipping, including air emissions (Article III). Another topic emerging from the Article I, that was left outside the scope of the dissertational research and developed elsewhere (Gritsenko and Pentz, 2014), is the struggle between supranational EU institutions seeking authority in maritime affairs through multi-level public-private linkages and the recent political nationalism of the EU member states seeking to protect their power by adhering to hierarchical ordering.

Inductive strategy of investigation in the Article I highlighted the patterns arising from data that were not included in the initial theoretical model. Contributions of Article I to the overall research is mainly twofold. Firstly, it gave strong reasons for accentuating methodological localism and sketched the key concepts that were later used in all other studies; second, it gave broad picture of the research setting (factual knowledge), which

emphasized the importance of multiple contexts (including natural, functional, and politico-administrative). At the theoretical level the article claimed that the functional area of shipping and developments within fleet and transport patterns are a dynamic context for understanding politico-administrative arrangements and gave examples of how they impact governance interactions. It made clear (despite the initial plan to focus on macro level), that shipping governance is multi-leveled and polycentric. Thereby it opened up the path for paying attention to the interplay of functional, politico-administrative, and natural contexts in all other studies. Once all the individual studies were completed, the whole narrative and not only its singular parts were scrutinized vis-à-vis central empirical and theoretical questions of the thesis. Consolidated understanding of their meaning for the final argument is presented in Section 6.

5.2 Varying Patterns in Vessel Operational Quality and their Governance Implications *(co-authored with Dr. Kimmo Vehkalahti)*

Article II was designed as an exploratory study with a goal to better understand the nature of variation in quality specifically during vessel operation (including navigation, maneuvering, and stationary operations). It builds upon the hypothesis that the functional area of shipping is not homogenous, but different segments of the shipping industry indicate different patterns in operation quality. It thus seeks to clarify how institutional variation and the emergence of alternative strategies within the segments of the shipping industry can alter shipping governance process. In particular, it aims at placing different segments of the shipping industry in their respective contexts and speculates as to how these can affect the adaption of quality practices.

Shipping is a large area of the transport business, and it is characterized by heterogeneity: vessels of different purpose are designed in different ways, require specific maintenance, sail different seas, and specific institutional arrangements have emerged at different levels to give shape to process of vessel operation and maintenance. This study conceptualizes the quality of vessel operation as a governance problem. Showing that factors that influence the quality of vessel operational performance are diverse in nature, including technical (design, construction, equipment), operational (maintenance, human factor, crew qualification), regulatory (legislation, monitoring, control), non-regulatory (market incentives, reputational concerns), the governance of shipping externalities cannot be reduced to one type of measures (e.g., technical 'command-and-control' measures that dominated shipping governance for many decades).

From its design, this research consists of two parts: one seeks to establish patterns of variation in vessel operation quality and the second seeks to contextualize this variation to provide a complex view upon quality governance. In the first step, correspondence analysis (CA) is applied to the port State control (PSC) data to find patterns that explicate the relationship of vessel's performance, age, flag and type. The second step discusses the variation in quality of operation as a product of multiple contexts, including the supply chain, regulatory arrangements specific to certain segments (civil liability for oil pollution), development of environmental attitudes in the Baltic shipping (proliferation of the Clean Ship

approach). There are several innovations in the design of research. Firstly, it offers a different look at PSC data, which previously has been used predominantly to study shipping safety. In this research, a view upon PSC deficiencies as an *ex ante* indicator of future malfunctions and *ex post* of quality maintenance is adopted, relying on connection of PSC inspection parameters to the broader HSEQ management context. Secondly, the use of correspondence analysis in application to PSC data is rather rare. CA, an exploratory method strong in visualizing the results, has flexible data requirements, minimal information loss, and is well-suited in the context of MMR research to assist in the formulation of hypotheses, as it allows one to map patters derived from large data sets.

The results of empirical investigation regarding the quality of operation performance among tanker vessels was unexpected, as it contradicted with the laymen's image of Baltic oil tankers conveyed in the media as a rusty, old and doomed-to-capsize fleet. According to our CA analysis of inspection data, tankers operating in the Baltic Sea had the most operational quality in the PSC profile. Moreover, deterioration does not seem to be a decisive factor in constituting operation quality patterns. The empirical results made me think of how differences between shipping segments may be connected to their contexts: embeddedness in different supply chains, regulatory, cultural, and politico-administrative variation, all tend to impact interactions, and as a consequence, outcomes in governance of shipping quality. They also suggested that Baltic oil shipping may have developed governance mechanisms that supported collective action. This hypothesis inspired me to do a more in-depth investigation of the Baltic oil transport (Article IV), in which intuitions emerged in the Article II were confirmed, as well as additional evidence on the role of ports in quality shipping governance was found.

Polycentricity and multiple embeddedness crystallized as important concepts for understanding the patterns of shipping quality governance in Article II, which had several important contributions to further research. Firstly, it turned to the notion of 'quality shipping' as 'the key to effective mitigation of shipping adverse impacts', so that enhancing the quality of vessel operation would internalize the external cost, thereby reliving the pressure from society. In other words, the concept of externalities was used as an intermediary step towards the positive notion of quality shipping governance, developed in Article IV. Secondly, it further opened up discussion on 'global and local', finding empirical proof that despite blurring of national borders in the process of globalization, specific institutional arrangements may emerge at the interaction of several areas, bridging the jurisdictional levels and coordination actors within different contexts. Finally, it also emphasized multiactor interaction, showing how the growing scope of governing actors demanded new institutional mechanisms that can ensure the functioning of this complex system. In conclusion it states that since shipping is not a homogeneous area, and heterogeneity within shipping segments results in different operational and managerial patterns, and quality variation. Similar dynamics has been noticed by Pawlik (2012), who studied corporate social responsibility (CSR) practices in the shipping sector and discovered differences between container lines and other maritime logistic sectors. These differences are attributed to the structure of inter-organizational relations and container segment market orientation to final consumers

(business-to-consumers, or B2C) rather than other firms (business-to-business, or B2B). In container shipping more developed CSR practices were associated with B2C linkages realized through shipping lines' function of connecting global brands and their consumers, thus emphasizing the diversity in demand for quality shipping.

The Article II concludes that no 'one-size-fits-all' solutions can be found for different segments of the shipping market. Quality governance, simultaneously embedded within multiple contexts, needs to create conditions for collective action in the situation of strategic interdependency, and each type of situation may benefit from a specific policy solution. What seems to be important is to overcome coordination problems, especially between the users (cargo owners) and the providers (ship owners) of maritime transportation services. Additionally, the role of ports as a center of authority in shipping governance seemed to be strengthening and required further investigation.

5.3 Governing Shipping Externalities: Baltic Ports in the Process of SOx Emission Reduction *(co-authored with Dr. Johanna Yliskylä-Peuralahti)*

Article III offers an empirical investigation of the recent developments regarding SOx emission reduction in the Baltic Sea region in order to emphasize how polycentricity matters when shipping governance is concerned. Claiming that globalized shipping industry is contextually embedded, the study uses one specific case (air emissions reduction) in one concrete region (Baltic Sea region) to explain how in the presence of multiple decision makers unique governance patterns are produced. The topic of air emissions from shipping has been high on the Baltic agenda over the past years, and while conducting research for Articles I and II it has become obvious that ports have a potential to be more actively involved in governance of quality shipping. A study of SO_x emission reduction process in the Baltic Sea and the role of ports therein was undertaken to develop this intuition. The case-study first investigated how the actors in the maritime industry, in particular ports, anticipated the upcoming legislator changes, and thereafter scrutinized these adaptation strategies within the respective contexts. One of the innovations of this research was to bring forward energy policy issues, showing how the reduction of sulphur content in marine fuel as a strategy for better environmental quality in shipping is impacted by the issues belonging to the scope of energy-political discussion: uncertainties regarding fuel supply, prices, and distribution infrastructure.

Exploring the adaptation strategies that Baltic ports consider necessary in order to 'survive' after the introduction of the Baltic SECA, the study discovered two strategies that Baltic ports are likely to adopt: (1) preventing loss of traffic by creating compliance-friendly infrastructure; and (2) environmental stewardship/acting as environmental leaders, coordinating other actors and/or participating in multiactor cooperation themselves in order to raise the attractiveness of shipping as environmentally-friendly transport. The resulting strategies are understood as context-dependent, emphasizing that in other circumstances, other strategies may have emerged. The Baltic ports together with most of the actors involved in maritime transportation in the BSR have missed "the window of opportunity" to influence the design of SO_x reduction policies at the early stage, have been confronted with *de facto* coming

into force regulation, and did not have compliant choice other than adapting to new regulations. Yet, the empirical research highlights the increasing interaction *within* the private sector, which attempted to find most cost-efficient solutions to react to public regulation.

The empirical case-study shows how current strategies stem from the uncertainties in ports' operational environment, which owe to the specificity of the BSR as a politico-administrative area, as well as to the regional energy policy balance. SO_x emission reduction is a topical subject of research and the empirical contribution of the article is timely. It pinpoints how adaptation process that the maritime industry is undergoing at the present moment is not limited to technical discussion of technological solutions, but reduction of negative impacts needs 'looking outside the box'. Thereby it relates to the literature currently investigating new role images, role dilemmas, and coping strategies in the governance paradigm (Buethe, 2010b). Changes in operational environment impact actors involved into societal steering and the old power relations may be reconsidered to strengthen governance positions of newcomers in governance. This case-study brought empirical evidence of how new authority acquired by ports can add value when coping with collective actions problems in shipping.

The complexity of socio-political interaction in shipping quality governance was already reported in Articles I and II, which in different ways and from different angles gave indication that authority, responsibility, and decision making are more overlapping, cross-cutting, interconnected, than subordinate and hierarchically-structured. Whereas these first two articles mapped the terrain within quality shipping governance, they did not show the practical impact of multi-leveled and polycentric governance arrangements on collective action. The empirical evidence reported in Article III emphasized the fact that in the process of SO_x emissions reduction, governance mechanisms were case-specific, rather *ad hoc*, and grounded within the broader patterns of regional politics and governance. It eventually showed how "power is being exercised by actors located at different places and jurisdictional levels, and how multiple centers of decision making independent from each other can coexist" (Article II, p.3). The results of this study also emphasized the added value of integrating time and place as explanatory factors into the analysis; this analytical intuition was further strengthened in Article IV. A rather detailed discussion of polycentricity with an empirical illustration through the case-study and the attention to inherent rivalry and power struggles accompanying collective action problems are among the further contributions of the Article III.

5.4 Quality Governance in Maritime Oil Transport: the Case of the Baltic Sea

The last empirical study that constitutes a part of this dissertation is reported in Article IV. It is more consequent in problem description and closure, as it was written later and built upon the developments of the previous research stages, amplifying their strengths and taking a note of their weaknesses. It used the notion of quality shipping in a coherent manner; a systematic contextual investigation of interactions between multiple actors helps to explain which mechanisms and processes can be considered significant for the institutionalization of new practices. The paper describes the results of a case-study and uses the same method of data

collection and analysis as Article III, featuring broad range of qualitative data and paying attention to patterns arising from its content.

The case-study of oil transportation in the Baltic Sea is of a particular interest in the light of research conducted in previous three articles, in particular, it seeks to explain the patterns discovered and reported in Article II. This study is concerned with much-articulated risks associated with the maritime transport of oil, and seeks to shed light upon a less-explored dimension of tanker shipping, namely, the quality governance mechanisms. The case study shows that quality governance mechanisms at different levels are interconnected, rather than subordinated. Whereas there are developments at the global level (essentially, raising awareness of the risks associated with the maritime transportation of oil resulted in rising concerns about the oil transport safety and tightening up of global regulation, as well as increasing pressure upon the oil industry to engage with transportation as a part of their supply chain), the regional factors also make a difference in how quality is being defined and managed. In particular, construction of a specialized oil port – Primorsk – seems to have had an important role to play.

New infrastructure in Primorsk assisted in raising the quality of port operations (loading/unloading, bunkering, etc.), but also had an influence on practices and prompted new relations between actors in port, thereby fostering the development of new institutions. The phenomenon of technical modernization as a means to policy innovation has been widely discussed in ecological modernization literature (Jänicke, 2008). The quality assurance system in the port of Primorsk (restrictive interpretation of global norms, including the vetting system, and port-specific mechanism of mandatory rules operational in port) is thus one of the building blocks for the maintenance of shipping quality through the institutionalization of technical modernization and following policy innovation. Infrastructure as such becomes a means to conceptualize and communicate certain conceptions of quality, and related operational practices help to align rules and incentives by reducing informational and procedural uncertainties.

As this empirical study was the final one, it did not have direct implications for the other articles, but it has an important place in drawing the overall conclusions of the thesis, as well as for understanding the prospects for future research. In this article multiplicity of contexts ‘speak in full voice’: the study takes account of geographical area of the Baltic Sea with its specific natural, politico-administrative, and cultural characteristics and of the functional area of shipping, where each segment (tanker, container, bulk, ro-ro, etc.) has special features due to technical, constructive, and trade patterns, and the supply chain of the industry for which goods are transported (oil, manufactured goods, raw materials etc.). At the same time, an inherent political dimension of governance cannot be ignored. In the case of Baltic oil transport, Russian geopolitical ambitions and the importance of Baltic route for oil trade had a strategic role to play in developments of a quality assurance system in the port of Primorsk. Eventually, the article stresses that ultimately the quest for quality shipping is a search for situationally-effective ‘metagovernance’ arrangements, which in its turn requires “cultural sensitivity” (Meuleman, 2012, p.37), or understanding of how different constellations of contexts affect the dynamics of quality conventions, negotiation, and

implementation of rules, norms, and strategies for quality. Such knowledge has the potential to assist in developing institutions capable of delivering stable outcomes by linking actors and contexts in a way that balances supply and demand for quality shipping.

DISCUSSION

The main empirical findings of this research can be summarized as follows:

- In the Baltic Sea region dissimilar approaches to maritime governance and policy-making co-exist. Whereas nation states embedded within the international system of hierarchical governance locate maritime affairs in sovereign domain, the emergence of authority on supranational and subnational levels supports shift of roles and responsibilities to wider range of actors. In particular, this mismatch manifests itself through substantial difficulties in negotiating a common system of maritime governance between the Russian federal government, which closely links shipping affairs to sovereign foreign policy needs and aspirations, and the European Union, which strives to support more interactive forms of shipping governance, thereby assuming the role of nation state in maritime policy making as *primus inter pares*.
- Shipping as a commercial activity carried out in the Baltic Sea is not homogeneous: though all types of vessels share the overall functionality of shipping as a service of commodity transportation, each type of shipping is engaged in a different supply chain depending on the type of transported commodity. In the Baltic Sea, crude oil and oil products/chemicals transportation plays an increasingly important role due to the growing cargo flows of these commodities. However, causalities of tanker fleets did not grow proportionate to the increase in their traffic, and illegal oil spills decreased. The results of a detailed investigation of different segments of shipping industry indicate that tankers operating in the Baltic Sea have better operational performance than other types of vessels. This variation regarding operation quality can be regarded as related to different starting points and incentives for collective action offered by each shipping segment.
- The roles and responsibilities in Baltic maritime transport are *de jure* 'fixed' through a system of international, regional, and national legislation, however, authority has a *de facto* fluid character. The case of the introduction of the Baltic SECA shows how a challenge of adaptation to the new operational environment prompted the Baltic ports to re-consider and re-negotiate the roles in the governance process. The governance solutions for the SECA are not limited to the introduction of technological solutions, but include a proactive position of some ports acting as environmental leaders, coordinating other actors, and/or participating in multiactor cooperation, thereby engaging into coping with collective actions problems in shipping in a way that is not directly prescribed by any regulatory instrument.
- The risks of transporting oil in the vulnerable Baltic natural environment have been usually considered in the tragedy of the commons framework, which emphasizes that private incentive to pay for quality is not viable and cannot be realized in a situation of strategic interdependence, so actors as "rational utility-maximizers" will fail to internalize potential externalities. However, the same subject-matter can be considered in a context-bound framework, where in place of abstract 'rational utility-maximizers' concrete oil majors embedded within Russian geopolitical ambitions and the

importance of sea oil trade for budgetary income become dependent on assuring the quality of their activities in order to ensure an uninterrupted flow of oil to the world markets. The empirical material explains how the quality assurance system was built up in the port of Primorsk to realize the strategic role of oil transportation in the Baltic Sea.

The findings presented above are derived from the four studies (Articles I-IV) allowing interconnected, though varying insights on emergence and development of collective action by revealing how the practices associated with quality shipping were defined and materialized. At this point I would like to return to the empirical research questions of this project (formulated in the Section 1.2) and discuss in more detail how the empirical studies together contribute to investigation of the central research question of this project regarding the role of polycentricity in addressing multifaceted transboundary societal concerns. The four individual studies establish shipping as a domain akin to polycentricity by documenting the co-existence of multiple public and private actors governing shipping quality within the overarching framework of the Baltic Sea region, and then investigate these polycentric orderings by revealing which institutional mechanisms allowed the multiactor arrangements to proliferate and sustain themselves. An English proverb says that too many cooks spoil the broth. I found this metaphor very useful and inspiring when thinking of the results of my investigation. Indeed, too many cooks seem to spoil the soup in the framework of conventional collective action theory, but sometimes they also manage to achieve the coordination in the kitchen required to prepare a decent meal.

6.1 Too many cooks?

One of the aspects of contemporary shipping that draws scholars' attention is the colossal number of actors included in any type of transportation activity and, presumably, thereby having an effect on the governance process. Though nation states in their three legal roles (flag, port, and coastal state) remain important in terms of maritime governance, a plethora of actors beyond and beneath the states cannot be ignored as their relative power[10] and their practical engagement into quality shipping is considerable. Articles I-IV all point to the fact that the roles of actors within the maritime industry are changing. In particular ports and cargo owners have become more visible in the governance process as they acquire new responsibilities when new authority shifts their actions. Ports become more aware of their environmental stewardship; they get new responsibilities to ensure compliance both as a controlling body through inspection mechanisms and as an enabling environment through infrastructural development and innovation (Articles III and IV). Additionally cargo owners become more aware of the implications of their choices when they charter vessels (Article II and IV). Maritime technology manufactures and suppliers gain a powerful say in the governance process, as they deliver innovations that enable adaptation to new environmental regulation and ensure its certification and use (Article III). The proliferation of new actors in shipping quality governance signifies increased *de facto* polycentricity, yet it does not

[10] Roe (2012) noticed that the influence of major international companies such as Maersk can be compared to influence of nation states (p.129).

automatically lead to its institutionalization, as the recognition of this process requires a separate effort.

The emergence of new roles and changes in the construction of role images in the governance process is a discussion inherent to the governance literature (Aberbach and Rockman, 1988; Haufler, 2013). It is not only concerned with the 'decline of the State' (Ruggie, 1993; Meyer et al., 1997; Jessop, 2002b) or proliferation of new forms of 'governance without government' (Rhodes, 1996), but also with understanding what signifies successful efforts to re-define actors' place in governance process, which sources of legitimization the newcomers exploit, and how the traditional governing actors retain their power (Scharpf, 1994; Torfing and Triantafillou, 2013). By studying the changing roles in the governance process, this literature seeks to shed light on 'how the interactive forms of governance also affect and transform the ways that power is exercised" (Torfing et al., 2013, p. 49). This dissertation makes an empirical argument to support the proposition that quality shipping governance, as any other type of interactive governance, is not a technical depoliticized process of 'problem-fixing', but a battlefield overrun with power struggles and conflicts over resources, images, and institutions. Further research shall analyze the democratic implications of *de facto* power redistribution and look for ways to add transparency to complex interactive processes with large societal impacts, such as quality shipping governance.

6.2 Too many rules?

Institutions for quality shipping governance in the Baltic Sea have a diverse origin: some draw upon the international regulatory frameworks, some constitute a part of the regional politico-administrative arrangements, some stem from private initiatives. Prior research emphasized that the variety of formal and informal rules structuring interactions in quality shipping governance is considerable (Furger, 1997; Hawkins, 2001; Kaps, 2004; Shinohara, 2005), but given potential equifinality, it might be difficult to understand this institutional diversity without engaging in thorough empirical research. One of the empirical ambitions of this thesis was to address the process of institutional development and change as a continuous process, where institutionalization and de-institutionalization is reflected in a symbiotic relationship between formal and informal institutions together creating the arsenal of "rules-in-use".

Formal rules aimed at the coordination of collective action differ from one segment of shipping to the other, as do the informal rules, norms, and strategies (Article II). Since formal command-and-control rules are only capable of setting quality standards, which typically define minimal requirements and provide little incentive to go beyond them, informal strategies are central for the definition of quality as a shared understanding within the industry. Informal rules grew in importance as the actors sought to fill in the gaps in the existing regulation or alter the substance of outdated institutions to be able to cope with growing regulatory competition by giving them new meaning in the process of informal institutionalization (Ng et al., 2013). Not only governance arrangements, but also the actors engaged into quality shipping governance become more institutionalized as they form

coalitions, consortia, and other types of alliances to gain more power in processes that steer collective action (Article III and IV). Though institutionalization is usually understood as an increase in governance capacity, the scholarly debate on over-institutionalization and its dangers for successful collective action is still open. Excessive institutionalization may make the governance process more exclusive and hinder access for actors, which may become relevant in the future and limit the innovative potential of the whole process (Torfing et al., 2012, p. 106).

The study of SO_x emissions reduction reported in Article III shows empirically the interrelation between formal and informal rules as new linkages emerged between the different actors and group of actors involved in emission mitigation process. Whereas limiting sulphur content of fuel is in line with command-and-control paradigm of regulatory environmental governance, the adaptation process is not limited to technical standardization of mitigation technology. Against the background created by the global regulation (Annex VI to MARPOL convention, which addresses vessels and seeks to regulate sulphur content in marine fuel), other governance processes emerge, such as the development of ports as enabling environments to meet the upcoming changes, proliferation of quality certification, adoption of voluntary self-regulation. Yet, new rights and responsibilities that ports are *de facto* gaining are not mirrored in formal rules (at least, not for the moment). Whether or not the emerging informal governance shall be formalized, and if yes, how linkages between private actors and the public sector can be created are discussed in contemporary governance literature (Howlett and Rayner, 2006; Jochim and May, 2010). The relation between the public and private actors in providing governance can also institutionalize 'informality', as in case of Primorsk, where the Russian state realizes and uses the potential of port to facilitate and guard quality without implementing overarching regulation (which can be seen as one of the multiple cases of what Gel'man refers to as "post-Soviet 'informality'" (2012, p. 296)).

Eventually, the empirical studies emphasize that the governance of quality shipping is not a neatly organized process as the analysis of formal institutional structure may suggest. In practice, the "rules-in-use" are not nested, neither are they hierarchically organized, but rather they are complementary and/or overlapping. The institutional isomorphism is characteristic both for horizontal and for vertical governance arrangements, which is well exemplified in the case of tanker shipping quality assurance (Article IV). In addition to a multi-level system of global (e.g., IMO MARPOL Annex I), regional (e.g., BSR ban of single-hull) and local (e.g., port-specific ice class norms) regulation on tanker quality standards, there are a number of quality inspections (classification, vetting, port inspection), performed essentially at the same governance level, but within different authorities, so that rules emerged within the oil industry impact practices within maritime transport industry and vice versa.

6.3 How do(es) context(s) matter?

Quality shipping can be seen as an attempt to overcome the ambiguity of the relationship between environment and shipping. On the one hand, maritime vessels offer a comparatively energy-efficient way of transporting commodities on a large scale, on the other hand, the rising awareness of negative environmental and health impacts of shipping has motivated

policymakers to tighten environmental regulation of maritime activities. At the same time, the adverse environmental impacts of global shipping can be regarded as a phenomenon that the recent governance literature refers to as "super wicked problems" (Levine et al., 2012; Varone et al., 2013). This class of problems, including climate change, global financial arrangements, management of scarce natural resources or technological risks, are all characterized by (1) urgency ("time is running out"); (2) weak or non-existent central authority; (3) problem of agency (those who solve the problem also cause it); (4) lack of credible future commitments (Levine et al, 2012, p. 124). Since super wicked problems have transboundary implications and may be linked simultaneously to multiple contexts, the institutions developed within one state or one level of government cannot adequately address them, thereby, requiring policy solutions that can bridge the gaps between territorial jurisdictions, policy areas, and integrate relevant actors in public and private sectors into an interactive contextually-bound governance process (Christopoulos et al., 2012; Varone et al., 2013).

In maritime research literature, rather little attention has been paid to the multiple contexts in which quality shipping is conceptualized, operationalized, and practiced. The environmental problems created by maritime transportation in the Baltic Sea region are not unique, but the regional natural conditions (e.g., vulnerability, low salinity), transportation patterns (e.g., extensive oil transport) and institutional network (abundance of organizations and cooperation schemes) create a unique setting. An attempt to analyze quality shipping governance as a product of hierarchically organized levels (global, national, and local) might lead to misunderstanding and misinterpretation of contextual effects, as the nature of the phenomenon is not only multi-leveled, but also inherently polycentric. This draws attention to the concept of 'metagovernance', or the 'governing of governing' (Kooiman, 2003b; Sørensen, 2006), in particular, how to connect and coordinate quality shipping governance, given that in shipping distinction between politico-administrative areas is not identical to functionalities of maritime transport and authority has a complex configuration, consisting of public, private, and mixed arrangements sustained at different levels and separate localities.

Since context consists of multiple elements, which in their interplay add to collective action, it influences the notion of quality (what quality means in this concrete context), the composition of governing actors (*de facto* agency may not fully overlap with *ima* formal arrangements), as it also defines the 'room for manoeuvre' (which constraints are posed upon the governance process). All articles show that the fact that certain transportation activity happens 'here and now' and not 'there and then' contributes to explanation of how oil shipping is different from bulk (Article II), how the EU-RF relations have an impact on shipping governance practices (Article I), and how energy balance and port infrastructure and all other materiality characteristic for the area has ultimate importance on emergence and development of quality practices (Articles III and IV). Governance as a process of collective steering immersed in tangible geographical regions has been the lead theme of the EU governance scholarship (Heritier, 2002; Treib et al., 2007; Piattoni, 2009), yet, the "Eurocentric bias" (Risse, 2012) of this literature hindered the application of contextually-sensitive analysis to other transboundary settings. The importance of contextual factors emphasizes that a governance mix is "required to reflect the local environmental

characteristics and knowledge of the local societal functions but without losing alignment with the needs at the global level" (Christopoulos et al., 2012, p.319). In order to coordinate governing actors in a context-specific manner, awareness of the given situation and the range and scope of different contexts should be gained through empirical research.

6.4 How not to spoil the broth?

The hierarchically organized regulatory system based on subordination of levels of authority has been acknowledged as inappropriate to cope with the reality of shipping as a globalized business with transboundary adverse effects (Roe, 2012). At the same time, a lack of empirical evidence on how collective action problems are solved in regard to super wicked problems in general and quality shipping governance in particular has limited the scholarly ability to develop concepts, advance theory, and find methodological solutions to improve our understanding of the practical applications of interactive governance and the role of polycentricity (Torfing et al., 2012, p.239). This thesis argues that despite the weakness of state-shipping relationship (Roe, 2012, p. 398), shipping is not disconnected from politico-administrative, natural, and functional contexts, which create unique constellations of actors and rationalities with a potential to deliver situationally-effective solutions to collective action problems. Yet, the empirical studies of these constellations draw our attention to the following issues.

Firstly, increasing uncertainties in the operational environment caused by regulatory changes (e.g., Baltic SECA), market fluctuations (e.g., oil price fluctuation, rise of LNG) and technological innovation (e.g., new navigational systems, alternative fuels) prompted engagement of individual actors (shipping companies, ports, authorities, cargo owners) into voluntary self-governance in maritime domain, especially regarding the quality of vessel operations (Articles I-IV). This indicates that whereas the existing governance rests on structures that do not mirror the real-world setting, the actors themselves are struggling to cope with it – and wish for renewal. Among their coping strategies is a search for 'local openings' to engage into governance of their (global) business. The mechanisms of quality governance in shipping discovered in this research rely on the same principle: they link actors within supply chains based on proximity, thereby exposing them to scrutiny from immediately-engaged partners rather than from top-down assigned authority. Industry inspections (vetting), private certification, cargo-owners commitment to choices of quality vessels, ports incentive schemes to improve environmental performance are examples of how 'market for lemons' (Akerlof, 1970), or information asymmetries that occur when the seller knows more about a product than the buyer, can be reduced.

Secondly, the empirical studies included in this research highlight that actors involved into Baltic maritime transport realize the tensions between global and local, public and private, formal and informal, thus, the inherently polycentric nature of shipping as a commercial societal activity. They also indicate, that it is not the mere existence of multiple actors, but the ambivalence of their position vis-à-vis each other and formal rules, which may cause institutional failures. This ambivalence may impact the extent to which multiple actors *de facto* engaged in quality shipping governance perceive themselves as a part of collective

governance process and are willing to contribute to solving collective action problems. In a polycentric system of governance rules are expected to be scaled to impact thereby ensuring a better fit between problems and solutions. In practice, acknowledging polycentricity may require more inclusive, interactive, and flexible procedures to ensure that actors consider themselves as potential contributors to quality shipping governance.

Finally, the empirical evidence in this project implies that quality shipping is a collective endeavor that requires involvement of multiple actors. Due to the ambiguity of role images and lack of interactive spaces in the current system, actors may choose if they wish to recognize the existence of polycentricity, thereby engaging into informal cooperation, or prefer to act within the strictly defined formal frames, or take advantage of regulatory inconsistencies and implementation deficits. Though *de facto* authority in shipping has never been solely in the hands of the nation states (De Vivero et al., 2009), the more that actors realize their changing positions in the governance process, the more new processes are launched within the old frameworks. As a result, governance may either fail by suffering a mismatch between process and structure (Börzel and Risse, 2010), or provide for policy change as new roles become institutionalized (Pattberg, 2005). The outcome will depend on the design of metagovernance. Meuleman (2012) claims that only "culturally sensitive metagovernance" can deliver effective solutions to super wicked problems. His normative conception of metagovernance goes "beyond states and other existing institutional borders, beyond existing ways to measure progress, beyond linear forms of innovation, and beyond cultural integration or assimilation" (p.37) to coordinate different types of governance. Yet, if the state, the market, the civil society, or any combination of the above-mentioned actors will be the future metagovernor of quality shipping is a subject to further research.

CONCLUSIONS

7.1 Theoretical implications

The argument about the role of polycentricity for the emergence and development of mechanisms for collective action in governance of quality shipping in the Baltic Sea developed in this thesis has implications for the broader discipline of public policy research, which examines drivers and constraints to effective human social and political cooperation. The practical contribution of this study is in elaborating a framework for formulation and implementation of socio-economic innovation for balanced development and public well-being in the realm of quality shipping governance. The case of globalized shipping industry is an interesting one, since the conventional approaches are skeptical regarding the success of collective action in governance of super wicked problems. Yet, the emergence and development of arrangements for quality shipping point to the fact that collective action problems can be partially resolved even in areas prone to 'collective irresponsibility'.

In particular, the empirical work presented in this thesis contributes to four interconnected theoretical debates on governance: on the role of politics and power, on the territorial dimension of boundary-spanning governance, on the new role images and role dilemmas, and on governing of governance, or metagovernance. The empirical studies portray much of the interaction in existing quality shipping governance as informal and *ad hoc*. It happens beyond, beneath, and within the given politico-administrative context and is dictated by the specificity of shipping as a functional area. In situations where multiple actors by virtue of circumstances become exposed to scrutiny from immediate business partners (e.g., sellers vis-à-vis buyers) rather than from hierarchically assigned authority 'from above', quality governance practices can emerge and develop.

Practices for quality shipping observed in the empirical studies are connected to contexts that enhanced accountability and disclosure, to situations that opened up the actions of each of the involved parties, thereby decreasing the level of ignorance. As in a classical assurance game, new actors (e.g., ports and cargo owners) voluntarily assumed responsibility and took actions in situations that strengthened their belief in the cooperativeness of other actors. Private incentives to engage can be associated with reputational concerns in situations where belonging to a certain intersection of functional and politico-administrative contexts raised the accountability of all operations. Thereby, the process of quality governance in the Baltic Sea shipping challenges conventional assertions that shipping requires solely global solutions.

Yet, the optimism in regard to the ability of interactive governance to solve collective action dilemmas should be tempered by acknowledging power struggles and political conflicts inherent to any form of socio-political interaction. The power dimension of quality governance in shipping stems from the fact that quality is not an end in itself. Rather, it is inherently related to problem solving (e.g., mitigating adverse effects from shipping), hence the need to agree on what is quality and how quality outcomes can be produced. This is true for all collective actions problems and poses questions in regard to governance arrangements that allow internalizing conflicts and provide frameworks for cooperative rather than

competitive solutions to social dilemmas. Thus, in order to facilitate and direct the development of multiactor quality governance, a metagovernance may be required.

The application of methodological localism as a central research principle is a principal innovation of this study to advance the theoretical paradigm. The research sought to find methodological solutions to applying conceptual framework of governance and collective action to the distinct empirical settings. The articles served a purpose of calibration: using different methods and different data sets they together helped to define a set of theoretical concepts that allows one to deal with the topic in a coherent manner. Therefore the empirical work permitted ways to better understand the world of contemporary shipping and the world of collective action in globalized industries. The constant iteration between the conceptual framework and the empirical information arising from the studies allowed for combining the 'local knowledge' with more general (theory-deduced) knowledge claims on the basis of methodological localism to describe and explain how challenges to public policymaking could be addressed in the light of changing societal organization.

A key argument in this thesis is that whereas the shipping industry is global, quality shipping governance is not; therefore, quality shipping governance takes a form of contextually-bound steering. In those cases where quality governance emerged, it emerged as a sum of multiple interactions embedded within the natural, politico-administrative, and functional contexts. Since quality cannot be a subject to top-down control, it is a collective endeavor and a product of collective action, which, nevertheless, may benefit from existence of a "shadow of hierarchy" or some other type of metagovernance arrangements. If we want more quality shipping, we need to be able to explain and master the connecting relation between actors and institutions that enhance multiactor coordination and make collaboration work.

7.2 Policy recommendations

The transformative character of scientific knowledge for policymaking has been acknowledged for more than four centuries (Bacon, 1625). The issues raised in this research are not only intellectually engaging and novel in respect to theory-building, but they also have practical relevance. Given that the regulation of maritime activities has been extensive in the past few decades and further changes are on their way, scientific contribution to explain governance failures and best practices, even imperfect or incomplete, is desirable to assist future policy making.

The discussion of democratic governance is far from being new, however, the meaning of democratic institutions is seldom addressed when the subject-matter concerns 'technical domains', such as shipping. By 'democratic' here I refer to accountable, transparent, inclusive, negotiated system of rules, norms and strategies based on a shared understanding of responsibility, sustainability, and quality. Quality shipping as opposed to the 'black box' of shipping is (to be) based on knowledge rather than ignorance. Thus, transition to quality governance requires informed policy changes to be able to address potential limitations of interactive forms of governance regarding its effectiveness, democratic accountability and transparency. Based on the results of my investigation, three key issues can be emphasized in

respect to future regulation and governance: broadening, targeting, and anchoring.

- ***Broadening***

By 'broadening' I refer here to a need to diversify regulations in terms of their: (1) type; (2) scope; (3) addressees. Whereas regulation in the last years has come in different forms (command-and-control, market-based incentives, environmental taxes, etc.), what is still missing is a better integration of private regulation within the dominant public legal system. One of the best examples is shipping inspections: an oil tanker may undergo different inspections several times a year, though the cost associated with the duplication of inspection effort could be avoided if public and private inspections could be better coordinated. Regulation can also be broadened in terms of its scope. Often standardization of certain technical parameters (e.g., vessel particularities or fuel content) is introduced as central regulatory instrument, though factors that impact the outcome are much more diverse. Better understanding of operational processes typical of different types of shipping can help to address a broader range of issues. Finally, broadening the scope of actors included into the governance process is crucial. Transition to quality governance will require the acceptance of the inherent polycentricity of shipping. The integration of relevant stakeholders based on strengthening the existing formal and informal maritime networks (e.g., by bridging already existing support tools, providing access to accurate and timely information, promoting innovation) and their inclusion into the governance process seem to be among the key solutions to improving the effectiveness of quality governance.

- ***Targeting***

Targeting is inherently connected to broadening. As regulation becomes more differentiated, to remain meaningful it needs to avoid 'one-size-fits-all' approaches. Targeting means giving incentives to actors to realize their governing potential and take responsibility for the process of quality governance. Firstly, the Baltic ports seem to have realized their potential in the emission mitigation process, which will subsequently shift their role in the governance process. On the one hand, ports are involved in the creation of a compliance-friendly infrastructure to help shipping meet the new Baltic SECA operational requirements (e.g., shore-side electricity, availability of compliant fuels, and reception of SCR waste). On the other hand, ports seek to raise their own environmental profiles and the attractiveness of shipping as an environmentally-friendly mode of transport by acting as environmental pioneers and leaders of change, welcoming new technology and giving incentives for compliance (e.g., offering performance-based reductions on port duties). Thus, the establishment of the Baltic SECA can be seen as a motivator to re-consider and re-negotiate the roles of certain actors in the governance process. Indeed, there are reasons to assume that the Baltic SECA can shift the accents within the existing governance structure, thereby creating new processes, new linkages, and new responsibilities. The emission reduction policies have been anticipated by the maritime industry by active partaking in the discussion of how the new SECA standards can be met. The activation of public discussion can be seen as the first step towards change in balance of power among the industry's stakeholders.

- ***Anchoring***

Finally, as the third principle for policy-making, I suggest anchoring quality shipping in

respective contexts: not only regulatory (politico-administrative), but functional (supply chains), natural, and cultural. Shipping companies operating in the BSR have been anchoring the new SECA requirements in their corporate social responsibility (CSR) policies. Cutting air emissions before the new regulation came into force has become a part of corporate responsibility profile of, e.g., Maersk and Wallenius Wilhelmsen, which emphasized their willingness to contribute to development of sustainable supply chains (Yliskylä-Peuralahti and Gritsenko, 2014). However, CSR is not limited to emission mitigation, and has a potential to improve the connections between the actors within the maritime industry as well as within the supply chains by bringing more transparency and accountability into shipping operations. CSR can be seen as a substantially new way of approaching the externalities problem and the establishment of ECAs can prompt consolidation of CSR implementation in these areas. Finally, ECAs can strengthen the spatial element in shipping externalities governance. Despite the wide-spread thesis that shipping is a globalized industry that requires global solutions, pollution from shipping and governance of shipping externalities are located in a certain time and space. The instrument of ECA is thus a recognition of local potential to deal with adverse impacts from shipping, even though air emissions, which do not respect spatial borders, are in question. Despite the transboundary nature of pollution, the ECAs emphasize the importance of local solutions, thereby concentrating problem-solving within the maritime networks in the ECA regions.

7.3 Looking ahead

As this research is only a humble attempt to bring to light some of the important issues in the field of quality shipping governance, it is vital to mention what other issues emerged but were left outside of the present dissertation. Different philosophical and axiological positions borne by theoretical traditions and individual researchers can inform different views on the ultimate destiny of resolving the social dilemmas: individuals are stuck and doomed to a suboptimal result, in certain situations individuals can avoid the worst, or even achieve some optimum. This research has a humanistic aspiration to believe that collective action problems are not unavoidable feature of human interaction, but rather a symptom of inappropriate (monocentric) governance, of (hierarchical) institutional designs that lack diverse multiactor inputs, and thereby miss out on checks-and-balances. In a broader perspective this research is not only a humanistic project that wants to show that there are situations where human actors are able to avoid suboptimal results and find path to cooperate without standards enforced by public hierarchy, but also a critique of current state of affairs in maritime industry, which often nourishes collective irresponsibility.

As 90% of all world trade is performed by sea transport, each of us is indirectly involved in the functioning of the shipping and each of us is in a broader sense a stakeholder, though seldom an actor in maritime governance. In future research it appears crucial to continue pondering the questions of democratic policymaking, lobbying, and supply chain involvement, and of how to make governance more transparent and inclusive. Given the nature of implementation deficits in shipping governance, instead of putting all the effort on tightening up rules for the same actors, empowering a broader range of actors can be publicly

supported. The self-governing capacity of the maritime industry can be encouraged by entrusting actors to craft their own rules, basing them on their local situation in order to avoid the emergence of ambiguous positions and mismatching rules promoted by experts from afar. It appears to be equally important to go beyond shipping operations and turn to all cycles of shipping by adopting a life-cycle approach to quality governance. Ship-building and ship-breaking already emerge as new issues in quality shipping, but understanding governance patterns that sustain these areas is one of the next research tasks. When that is done, we can try to find a framework for describing the complexity of maritime transport with its embeddedness in all other spheres, areas, and materialities.

Finally, attention should be paid to two non-technical issues concerned with shipping quality. One is safety culture. For a long time it has mostly been the 'hardware' (quality standards for vessels, equipment, fuels etc.) that enabled improvements of quality. Yet, with the growing intensity and complexity of shipping flows human factor as the 'software' of quality shipping has proven to be equally and even more important. Thus, research on quality shipping at the micro-level is one of the upcoming research tasks. Another is to scrutinize the relation of shipping and energy in its various aspects. Energy has a crucial meaning for quality in shipping currently powered by fossil fuels, but in the future, alternative fuels and alternative sources of energy shall become part of the quality shipping debate as continuous reliance on fossil fuels in the light of energy imbalances is ambiguous. Developing shipping governance research in the above-mentioned directions will help to elevate the level of knowledge, reduce uncertainty regarding intentional and unintentional outcomes, assist policymaking, and eventually raise quality in shipping worldwide, contributing to balanced development of maritime transport, minimized adverse environmental effects, and maximized economic and social benefit.

List of abbreviations

AIS – Automatic Identification System
ANT - actor-network theory
APM - associated protective measures
BSR - Baltic Sea region
BSRS – Baltic Sea Region Strategy
BWM Convention - the International Convention for the Control and Management of Ships' Ballast Water and Sediments
CA - correspondence analysis
CBSS – the Council of the Baltic Sea States
CLC – the International Convention on Civil Liability for Oil Pollution Damage
CPR – common-pool resources
CSI – the Clean Shipping Index
CSR – corporate social responsibility
DWT – deadweight tonnage
ECA - emissions control area
EEDI - Energy Efficiency Design Index
EEZ – exclusive economic zone
EMSA – European Maritime Safety Agency
EU – European Union
GHG - greenhouse gas
HELCOM - Helsinki Commission
HFO - heavy fuel oil
HSEQ – health, safety, environment, quality
IACS - International Association of Classification Societies
IMO – International Maritime Organization
INTERCARGO - the International Association of Dry Cargo Shipowners
INTERTANKO - the International Association of Independent Tanker Owners
ISM Code – the International Safety Management Code
LNG - liquefied natural gas
MDO - marine diesel oil
MGO - marine gas oil
MLC – the Maritime Labour Convention
MVM - multivariate methods
NO_x - nitrogen oxides
OCIMF - the Oil Companies International Marine Forum
ODS - ozone-depleting substances
OPRC - the International Convention on Oil Pollution Preparedness, Response and Co-Operation
PM - particulate matters
PRF - port reception facilities
PSC – port State control
PSSA - particularly sensitive sea area
SECA - SO_x Emissions Control Area
SEEMP - Ship Energy Efficiency Management Plan
SES - social-ecological systems
SO_x - sulphur dioxide
STCW Convention - The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
TSS - traffic separation schemes
UNCLOS - the United Nations Convention on the Law of the Sea
VOC - volatile organic compound
VTS - vessel traffic services

REFERENCES

Aalto, P., 2012. Russia's Energy Policies: National, Interregional and Global Levels. Cheltenham: Edward Elgar Publishing.

Aberbach, J.D., Rockman, B.A., 1988. Image IV Revisited: Executive and Political Roles. Governance 1, 1–25. doi:10.1111/j.1468-0491.1988.tb00057.x

Acciaro, M., 2014. Real option analysis for environmental compliance: LNG and emission control areas. Transportation Research Part D: Transport and Environment. doi:10.1016/j.trd.2013.12.007

Ackerman, J., 2004. Co-Governance for Accountability: Beyond "Exit" and "Voice". World Development 32, 447–463. doi:10.1016/j.worlddev.2003.06.015

Adcock, R., 2001. Measurement Validity: A Shared Standard for Qualitative and Quantitative Research. American Political Science Review 95, 529–546. doi:10.1017/S0003055401003100

Adger, W. N., Arnell, N.W., Tompkins, E.L., 2005. Successful adaptation to climate change across scales. Global Environmental Change, Adaptation to Climate Change: Perspectives Across Scales 15, 77–86. doi:10.1016/j.gloenvcha.2004.12.005

Adger, W.N., 2010. Social Capital, Collective Action, and Adaptation to Climate Change, in: Voss, M. (Ed.), Der Klimawandel. VS Verlag für Sozialwissenschaften, pp. 327–345.

Akerlof, G.A., 1970. The Market for "Lemons": Quality Uncertainty and the Market Mechanism. The Quarterly Journal of Economics 84, 488–500. doi:10.2307/1879431

Alderton, T., Winchester, N., 2002. Globalisation and de-regulation in the maritime industry. Marine Policy 26, 35–43. doi:10.1016/S0308-597X(01)00034-3

Aligica, P.D., Tarko, V., 2012. Polycentricity: From Polanyi to Ostrom, and Beyond. Governance 25, 237–262. doi:10.1111/j.1468-0491.2011.01550.x

Andersson, K.P., Ostrom, E., 2008. Analyzing decentralized resource regimes from a polycentric perspective. Policy Sci 41, 71–93. doi:10.1007/s11077-007-9055-6

Asariotis, R., Benamara, H., 2012. Maritime Transport and the Climate Change Challenge. London: Routledge.

Asheim, G.B., Mitra, T., Tungodden, B., 2012. Sustainable recursive social welfare functions. Econ Theory 49, 267–292. doi:10.1007/s00199-010-0573-7

Atlas, R.M., Bartha, R., 1973. Fate and effects of polluting petroleum in the marine environment, in: Gunther, F.A. (Ed.), Residue Reviews, Residue Reviews. Springer New York, pp. 49–85.

Axelrod, R., 1984. The Evolution of Cooperation. Basic Books.

Backhouse, R.E., Fontaine, P., 2010. The History of the Social Sciences since 1945. Cambridge: Cambridge University Press.

Bacon, F. 1625 (reprint 2002). Of seditions and troubles. Essays Civil and Moral. London: Printed by John Haviland for Hanna Barret.

Bailey, K., 2008. Methods of Social Research, 4th Edition. NY: Simon and Schuster.

Balint P., Stewart R., Desai A., Walters L. 2011. Wicked Environmental Problems - Managing Uncertainty and Conflict. Washington: Island Press.

BALTEX, 2007. The Baltic Sea Experiment. The Baltic sea Catchment Basin. Available from: http://www.baltex-research.eu/background/catchment.html. Accessed 18.4.2014.

Baltic Sea 2020, 2014. Baltic Sea 2020, "Shipping," Available from: http://www.balticsea2020.org/index.php?option=com_content&view= article&id=128&Itemid=87&lang=en. Accessed 18.4.2014.

Bates, R.H., Greif, A., Levi, M., Rosenthal, J.-L., Weingast, B., 1998. Analytic Narratives. Princeton: Princeton University Press.

Bates, R.H., Greif, A., Levi, M., Rosenthal, J.-L., Weingast, B., 2000. The Analytical Narrative Project. The American Political Science Review 94, 696–702. doi:10.2307/258584

Baumol, W.J., Oates, W.E., 1993. Economics, environmental policy, and the quality of life. New Jersey: Prentice-Hall.

Bengtsson, S., Andersson, K., Fridell, E., 2011. A comparative life cycle assessment of marine fuels liquefied natural gas and three other fossil fuels. Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment 225, 97–110. doi:10.1177/1475090211402136

Bennett, P., 2000. Environmental governance and private actors: enrolling insurers in international maritime regulation. Polit. Geogr. 19, 875–899. doi:10.1016/S0962-6298(00)00029-9

Bennett, P., 2001. Mutual risk: P&I insurance clubs and maritime safety and environmental performance. Mar. Policy 25, 13–21. doi:10.1016/S0308-597X(00)00029-4

Benz, A., 2004. Governance — Modebegriff oder nützliches sozialwissenschaftliches Konzept?, in: Benz, A. (Ed.), Governance — Regieren in komplexen Regelsystemen, Governance. VS Verlag für Sozialwissenschaften, pp. 11–28.

Berry, J.M., 2002. Validity and Reliability Issues In Elite Interviewing. PS: Political Science & Politics 35, 679–682. doi:10.1017/S1049096502001166

Bevir, M., 2010. The SAGE Handbook of Governance. Thousand Oaks: SAGE.
Bhaskar, R., 1978. A Realist Theory of Science. Hassocks: Harvester Press.
Biermann, F., 2010. Beyond the intergovernmental regime: recent trends in global carbon governance. Curr. Opin. Environ. Sustain. 2, 284–288. doi:10.1016/j.cosust.2010.05.002
Blomquist, W.A., 1992. Dividing the waters: governing groundwater in southern California. ICS Press.
Bloor, M., Datta, R., Gilinskiy, Y., Horlick-Jones, T., 2006. Unicorn among the Cedars: On the Possibility of Effective "Smart Regulation" of the Globalized Shipping Industry. Soc. Leg. Stud. 15, 534–551. doi:10.1177/0964663906069546
Bloor, M., Sampson, H., 2009. Regulatory enforcement of labour standards in an outsourcing globalized industry the case of the shipping industry. Work Employ. Soc. 23, 711–726. doi:10.1177/0950017009344915
Bloor, M., Sampson, H., Baker, S., Walters, D., Dahlgren, K., Wadsworth, E., James, P., 2013. Room for Manoeuvre? Regulatory Compliance in the Global Shipping Industry. Soc. Leg. Stud. 22, 171–189. doi:10.1177/0964663912467814
Blue Angel, 2014. Shipping: Blue Angel certifies ship design and ship operations. Available from: http://www.blauer-engel.de/en/blauer_engel/press/newsletter/newsletter_detail.php?we_objectID=223) Accessed 18.4.2014.
Blumer, M., 1971. Scientific Aspects of the Oil Spill Problem. Envtl. Aff. 1, 54.
Börzel, T.A., 1998. Organizing Babylon - On the Different Conceptions of Policy Networks. Public Administration 76, 253–273. doi:10.1111/1467-9299.00100
Börzel, T. A., 2010. Governance with/out Government. False Promises or Flawed Premises? SFB-Governance Working Paper Series, No. 23, Research Center (SFB) 700, Berlin, March 2010. Available from: http://www.sfb-governance.de/publikationen/working_papers/wp23/SFB-Governance-Working-Paper-23.pdf. Accessed 11.08.2014.
Börzel, T.A., Risse, T., 2010. Governance without a state: Can it work? Regulation & Governance 4, 113–134. doi:10.1111/j.1748-5991.2010.01076.x
Bovens, M., 2007. New Forms of Accountability and EU-Governance. Comp Eur Polit 5, 104–120. doi:10.1057/palgrave.cep.6110101
Brady, H.E., Collier, D., 2010. Rethinking Social Inquiry: Diverse Tools, Shared Standards. Rowman & Littlefield Publishers.
Brondizio, E.S., Ostrom, E., Young, O.R., 2009. Connectivity and the Governance of Multilevel Social-Ecological Systems: The Role of Social Capital. Annual Review of Environment and Resources 34, 253–278. doi:10.1146/annurev.environ.020708.100707
Brunila, O-P. And J. Storgård. 2012. Oil transportation in the Gulf of Finland in 2020 and 2030. Publications from the Centre for Maritime Studies University of Turku. A 61. Turku: University of Turku. Available from: http://www.merikotka.fi/mimic/images/stories/Brunila_and_Storgrd_2012_Oil_transportation_in_the_Gulf_of_Finland_in_2020_and_2030.pdf. Accessed 18.4.2014.
Buchanan, J.M., Stubblebine, W.C., 1962. Externality. Economica 29, 371–384. doi:10.2307/2551386
Büthe, T., 2010a. Private Regulation in the Global Economy: A (P)Review. Business and Politics 12. doi:10.2202/1469-3569.1328
Büthe, T., 2010b. Global Private Politics: A Research Agenda. Business and Politics 12. doi:10.2202/1469-3569.1345
Callon M, Law J., 2003. On qualculation, agency and otherness. Lancaster: Centre for Science Studies.
Carter, C., Smith, A., 2008. Revitalizing public policy approaches to the EU: "territorial institutionalism", fisheries and wine. Journal of European Public Policy 15, 263–281. doi:10.1080/13501760701817773
Carter, N., 2008. The Politics of the Environment: Ideas, Activism, Policy. Cambridge: Cambridge University Press.
Charmaz, K., 2006. Constructing Grounded Theory: A Practical Guide Through Qualitative Analysis. Thousand Oaks: SAGE.
Chatterjee, A., 2011. Ontology, Epistemology, and Multimethod Research in Political Science. Philosophy of the Social Sciences 0048393111415380. doi:10.1177/0048393111415380
Cheng, T.C.E., Choy, P.W.C., 2013. A study of the relationships between quality management practices and organizational performance in the shipping industry. Maritime Econ Logistics 15, 1–31. doi:10.1057/mel.2012.19
Chong, D., 1991. Collective Action and the Civil Rights Movement. Chicago : Univ. of Chicago Press.
Christopoulos, S., Horvath, B., Kull, M., 2012. Advancing the Governance of Cross-Sectoral Policies for Sustainable Development: A Metagovernance Perspective. Public Admin. Dev. 32, 305–323. doi:10.1002/pad.1629
Clean Cargo Working Group, 2014. Clean Cargo. BSR – The Business of a Better World. Available from: http://www.bsr.org/en/our-work/working-groups/clean-cargo. Accessed 18.04.2014.
Clean Shipping Index, 2014. Clean Shipping Index. Available from: http://www.cleanshippingindex.com/. Accessed 18.04.2014.
Coase, R.H., 1937. The Nature of the Firm. Economica 4, 386–405. doi:10.1111/j.1468-0335.1937.tb00002.x
Cole, D.H., 2011. From global to polycentric climate governance. Climate law 2, 395–413. doi:10.3233/CL-2011-042
Coleman, J.S., 1966. Individual interests and collective action. Public Choice 1, 49–62. doi:10.1007/BF01718988
Collier, A., 1994. Critical Realism: An Introduction to Roy Bhaskar's Philosophy. Michigan, Verso.

Collier, D., Elman, C., 2008. Qualitative and Multi-Method Research: Organizations, Publication, and Reflections on Integration. Social Science Research Network, Rochester, NY.
Commoner, B., 1971. The closing circle: nature, man, and technology. Knopf.
Corbett, J.J., Winebrake, J.J., Green, E.H., Kasibhatla, P., Eyring, V., Lauer, A., 2007. Mortality from Ship Emissions: A Global Assessment. Environ. Sci. Technol. 41, 8512–8518. doi:10.1021/es071686z
Crabb, A., Leroy, P., 2012. The Handbook of Environmental Policy Evaluation. London: Routledge.
Crawford, S.E.S., Ostrom, E., 1995. A Grammar of Institutions. American Political Science Review 89, 582–600. doi:10.2307/2082975
Danish Maritime Authority, 2013. Setting up a maritime business. Available from: http://www.dma.dk/SETTINGUPMARITIMEBUSINESS/Sider/default.aspx. Accessed 18.04.2014.
David, M., Gollasch, S., Leppäkoski, E., 2013. Risk assessment for exemptions from ballast water management – The Baltic Sea case study. Marine Pollution Bulletin 75, 205–217. doi:10.1016/j.marpolbul.2013.07.031
Della Porta, D., Keating, M., 2008. How many approaches in the social sciences? An epistemological introduction. In D. della Porta and M. Keating (eds.) Approaches and Methodologies in the Social Sciences. Cambridge: Cambridge University Press, pp.19-40.
Demeulenaere, P., 2011. Analytical Sociology and Social Mechanisms. Cambridge University Press.
Denzin, N.K., 2012. Triangulation 2.0. Journal of Mixed Methods Research 6, 80–88. doi:10.1177/1558689812437186
DeSombre, E., 2000. Domestic Sources of International Environmental Policy: Industry, Environmentalists, and U.S. Power. MIT Press.
DeSombre, E., 2006. Flagging Standards: Globalization and Environmental, Safety, and Labor Regulations at Sea (MIT Press Books). The MIT Press.
DeSombre, E., 2009. Voluntary agreements and the Shipping Industry. In M. Potoski and A. Prakash (eds.) Voluntary Programmes: A Club Theory Perspective. MIT Press. pp. 133- 156.
DeSombre, E., 2011. Globalization, Competition, and Convergence: Shipping and the Race to the Middle. Lynne Rienner Publ. Available from: http://journals.rienner.com/doi/abs/10.5555/ggov.2008.14.2.179 Accessed 18.4.2014.
Dolwick, J.S., 2009. "The Social" and Beyond: Introducing Actor-Network Theory. J Mari Arch 4, 21–49. doi:10.1007/s11457-009-9044-3
Duvanova, D., 2013. Building Business in Post-Communist Russia, Eastern Europe, and Eurasia: Collective Goods, Selective Incentives, and Predatory States. Cambridge University Press.
Earl, P.E., Potts, J., 2011. A Nobel Prize for Governance and Institutions: Oliver Williamson and Elinor Ostrom. Review of Political Economy 23, 1–24. doi:10.1080/09538259.2011.526291
Eckersley, R., 1992. Environmentalism and Political Theory: Toward an Ecocentric Approach. SUNY Press.
Ehrlich, P., 1968. The population bomb. Princeton: Princeton Univ. Press.
Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., Kyngäs, H., 2014. Qualitative Content Analysis. SAGE Open 4. doi:10.1177/2158244014522633
Elster, J., 1995. Forces and Mechanisms in the Constitution-Making Process. Duke Law Journal 45, 364. doi:10.2307/1372906
Endresen, Ø., Lee Behrens, H., Brynestad, S., Bjørn Andersen, A., Skjong, R., 2004. Challenges in global ballast water management. Marine Pollution Bulletin 48, 615–623. doi:10.1016/j.marpolbul.2004.01.016
EU BSRS, 2009. The EU Strategy for the Baltic Sea Region. Available from: http://ec.europa.eu/regional_policy/cooperation/baltic/index_en.htm. Accessed 18.04.2014.
Fafaliou, I., Lekakou, M., Theotokas, I., 2006. Is the European shipping industry aware of corporate social responsibility? The case of the Greek-owned short sea shipping companies. Marine Policy 30, 412–419. doi:10.1016/j.marpol.2005.03.003
Fielding, N., 2010. Mixed methods research in the real world. International Journal of Social Research Methodology 13, 127–138. doi:10.1080/13645570902996186
Finkel, S.E., Muller, E.N., 1998. Rational Choice and the Dynamics of Collective Political Action: Evaluating Alternative Models with Panel Data. The American Political Science Review 92, 37. doi:10.2307/2585927
Flin, R.H., O'Connor, P., Crichton, M., 2008. Safety at the Sharp End: A Guide to Non-technical Skills. Ashgate Publishing, Ltd.
Franzosi, R., 2004. From Words to Numbers: Narrative, Data, and Social Science. Cambridge: Cambridge University Press.
Freeman, R.E., 2010. Strategic Management: A Stakeholder Approach. Cambridge: Cambridge University Press.
Frels, R.K., Onwuegbuzie, A.J., 2013. Administering Quantitative Instruments With Qualitative Interviews: A Mixed Research Approach. Journal of Counseling & Development 91, 184–194. doi:10.1002/j.1556-6676.2013.00085.x
Furger, F., 1997. Accountability and Systems of Self-Governance: The Case of the Maritime Industry. Law & Policy 19, 445–476. doi:10.1111/1467-9930.t01-1-00035
Galaz, V., Crona, B., Österblom, H., Olsson, P., Folke, C., 2012. Polycentric systems and interacting planetary boundaries — Emerging governance of climate change–ocean acidification–marine biodiversity. Ecological Economics, Special Section: "Planetary Boundaries" and Global Environmental Governance 81, 21–32.

doi:10.1016/j.ecolecon.2011.11.012
Gardner, P, 2006. Historical analysis. In V. Jupp (ed.) The SAGE Dictionary of Social Research Methods, 2006. London: SAGE.
Gel'man, V., Ross, D.C., 2013. The Politics of Sub-National Authoritarianism in Russia. Burlington: Ashgate Publishing.
Gel'man, V., 2012. Subversive institutions, informal governance, and contemporary Russian politics. Communist and Post-Communist Studies, Disintegration of the Soviet Union. Twenty Years Later. Assessment. Quo Vadis? 45, 295–303. doi:10.1016/j.postcomstud.2012.07.005
George, A.L., Bennett, A., 2005. Case Studies and Theory Development in the Social Sciences. MIT Press.
Gilbert, M., 2006. Rationality in Collective Action. Philosophy of the Social Sciences 36, 3–17. doi:10.1177/0048393105284167
Glaser, B.G., Strauss, A.L., 2009. The Discovery of Grounded Theory: Strategies for Qualitative Research. Transaction Publishers.
Gläser, J., Laudel, G., 1999. Theoriegeleitete Textanalyse? Das Potential einer variablenorientierten qualitativen Inhaltsanalyse, Veröffentlichungsreihe der Arbeitsgruppe Wissenschaftstransformation des Wissenschaftszentrums Berlin für Sozialforschung (WZB), No. P 99-401.
Gläser, J., Laudel, G., 2010. Experteninterviews und Qualitative Inhaltsanalyse. VS Verlag für Sozialforschung.
Goldthau, A., 2014. Rethinking the governance of energy infrastructure: Scale, decentralization and polycentrism. Energy Research & Social Science 1, 134–140. doi:10.1016/j.erss.2014.02.009
Grabowski, M., Ayyalasomayajula, P., Merrick, J., Mccafferty, D., 2007. Accident precursors and safety nets: leading indicators of tanker operations safety. Maritime Policy & Management 34, 405–425. doi:10.1080/03088830701585084
Grech, M.R., Horberry, T.J., Humphreys, M.S., 2003. Fatigue and human error in the maritime domain. Presented at the Proceedings of the 5th International Conference on Fatigue and Transportation: Coping with a 24 hour society, National Road Transport Commission.
Green Ship Award, 2014. The pride of the oceans. Available from: http://www.greenaward.org/. Accessed 18.04.2014.
Greenacre, M., 2010. Correspondence Analysis in Practice, Second Edition. CRC Press.
Grewal, D., Darlow, N.J., 2007. The Business Paradigm for Corporate Social Reporting in the Context of Australian Seaports. Maritime Econ Logistics 9, 172–192. doi:10.1057/palgrave.mel.9100178
Gritsenko, D. and T.-Å. Pentz, forthcoming. Maritime Governance in The Baltic Sea Region: The EU's Success Story? In Grzechnik, M., Hurskainen, H. (eds.) Beyond the Sea: Reviewing the Manifold Dimensions of Water as Barrier and Bridge. Böhlau-Verlag GmbH.
Gruby, R.L., Basurto, X., 2014. Multi-level governance for large marine commons: Politics and polycentricity in Palau's protected area network. Environmental Science & Policy, Interrogating The Commons 36, 48–60. doi:10.1016/j.envsci.2013.08.001
Haas, P., Keohane, R. and M.. Levy (eds.) 1993. Institutions for the Earth: Sources of Effective International Environmental Protection. Cambridge: MIT Press.
Haas, P.M., 1990. Saving the Mediterranean: The Politics of International Environmental Cooperation. Columbia University Press.
Hair, J.F., 1995. Multivariate data analysis with readings. Prentice Hall.
Hajer, M.A., 2003. Deliberative Policy Analysis: Understanding Governance in the Network Society. Cambridge University Press.
Häkkinen, J. Posti, A., 2013. Overview of Maritime Accidents Involving Chemicals Worldwide and in the Baltic Sea In A. Weintrit & T. Neumann (eds.) Maritime Transport & Shipping - Marine Navigation and Safety at Sea Transportation. CRC Press, Taylor & Frances Group. pp. 15-25.
Hall P.A., 2003. Aligning Ontology and Methodology in Comparative Research. In: Mahoney J, Rueschemeyer D Comparative Historical Analysis in the Social Sciences. Cambridge, UK and New York: Cambridge University Press. Ch. 11.
Hall, P.A., Taylor, R.C.R., 1996. Political Science and the Three New Institutionalisms*. Political Studies 44, 936–957. doi:10.1111/j.1467-9248.1996.tb00343.x
Haralambides, H.E. (Ed.) 1998. Quality shipping - market mechanisms for safer shipping and cleaner oceans. Rotterdam: Erasmus Publishing.
Hardin, G. 1968. The Tragedy of the Commons. Science, New Series, Vol. 162, No. 3859 (Dec. 13, 1968), pp. 1243-1248.
Hardin, R., 1982. Collective Action. Baltimore: RFF Press.
Harrald, J.R., Mazzuchi, T.A., Spahn, J., Van Dorp, R., Merrick, J., Shrestha, S., Grabowski, M., 1998. Using system simulation to model the impact of human error in a maritime system. Safety Science 30, 235–247. doi:10.1016/S0925-7535(98)00048-4
Hassler, B., 2011. Accidental Versus Operational Oil Spills from Shipping in the Baltic Sea: Risk Governance and Management Strategies. AMBIO 40, 170–178. doi:10.1007/s13280-010-0128-y
Haufler, V., 2013. A Public Role for the Private Sector: Industry Self-Regulation in a Global Economy. Carnegie Endowment.

Hawkins J., 2001. Quality Shipping in the Asia Pacific Region. International Journal of Maritime Economics 3, 79–101.
Hayek, F.A., 1973. Law, Legislation and Liberty, Volume 1: Rules and Order. University of Chicago Press.
Heckathorn, D.D., 1996. The Dynamics and Dilemmas of Collective Action. American Sociological Review 61, 250. doi:10.2307/2096334
Heckathorn, D.D., 1997. Respondent-Driven Sampling: A New Approach to the Study of Hidden Populations. Social Problems 44, 174–199. doi:10.2307/3096941
Hedlund, S., 2011. Invisible Hands, Russian Experience, and Social Science: Approaches to Understanding Systemic Failure. Cambridge: Cambridge University Press.
Hedström, P., Ylikoski, P., 2010. Causal Mechanisms in the Social Sciences. Annual Review of Sociology 36, 49–67. doi:10.1146/annurev.soc.012809.102632
Heinrich, H.W., 1959. Industrial accident prevention – A scientific approach. New York: McGraw–Hill Book Company.
HELCOM, 2009. Eutrophication in the Baltic Sea – An integrated thematic assessment of the effects of nutrient enrichment and eutrophication in the Baltic Sea region. Balt. Sea Environ. Proc. No. 115B.
HELCOM, 2010a. HELCOM Ministerial Declaration on the implementation of the HELCOM Baltic Sea Action Plan, 20 May 2010, Moscow.
HELCOM, 2010b. Maritime Activities in the Baltic Sea – An integrated thematic assessment on maritime activities and response to pollution at sea in the Baltic Sea Region. Balt. Sea Environ. Proc. No. 123
HELCOM, 2013. Draft Report on Shipping Accidents in the Baltic Sea Region, Maritime Group 13th Meeting Szczecin, Poland, 26-28 November 2013. Available from: http://meeting.helcom.fi/c/document_library/get_file?p_l_id=18827&folderId=2477596&name=DLFE-55135.pdf. Accessed 18.04.2014.
HELCOM Response, 2013. Illegal discharges of oil in the Baltic Sea during 2012. HELCOM Baltic Sea Environment Fact Sheets. Online. Available from: http://www.helcom.fi/baltic-sea-trends/environment-fact-sheets/. Accessed 18.04.2014.
HELCOM Land, 2014. HELCOM at work, Land group. Available from: http://helcom.fi/helcom-at-work/groups/land/. Accessed 18.04.2014.
HELCOM Maritime, 2014. HELCOM at work. Maritime group. Available from: http://helcom.fi/helcom-at-work/groups/maritime. Accessed 18.04.2014.
HELCOM The Baltic, 2014. The Baltic - An Introduction. Available from: http://helcom.navigo.fi/environment/intro/en_GB/introduction. Accessed 18.04.2014.
Helmke, G., Levitsky, S., 2004. Informal Institutions and Comparative Politics: A Research Agenda. Perspectives on Politics 2, 725–740. doi:10.1017/S1537592704040472
Heritier, A., 2002. Common Goods: Reinventing European and International Governance.
Heritier, A., Rhodes, M., 2011. New Modes of Governance in Europe: Governing in the Shadow of Hierarchy. Palgrave Macmillan.
Hetherington, C., Flin, R., Mearns, K., 2006. Safety in shipping: The human element. Journal of Safety Research 37, 401–411. doi:10.1016/j.jsr.2006.04.007
Hjorth, R., 1992. Building international institutions for environmental protection : The case of Baltic Sea environmental cooperation.
Holzinger, K., 2003. The Problems of Collective Action: A New Approach. Preprints aus der Max-Planck-Projektgruppe ”Recht der Gemeinschaftsgüter”. Bonn, 2003/2. Available from: https://www.coll.mpg.de/pdf_dat/2003_02online.pdf. Accessed 11.08.2014.
Homans, G.C., 1950 (reprint 1992). The Human Group. Transaction Publishers.
Howlett, M., Rayner, J., 2006. Convergence and Divergence in Arrangements: Evidence from European Integrated Natural Resource Strategies. Journal of Public Policy 26, 167–189. doi:10.1017/S0143814X06000511
Huitema, D., E. Mostert, W. Egas, S. Moellenkamp, C. Pahl-Wostl , and R. Yalcin. 2009. Adaptive water governance: assessing the institutional prescriptions of adaptive (co-)management from a governance perspective and defining a research agenda. Ecology and Society 14(1): 26. Available from: http://www.ecologyandsociety.org/vol14/iss1/art26/. Accessed 11.08.2014.
Hülsse, R., 2007. Creating Demand for Global Governance: The Making of a Global Money-laundering Problem*. Glob. Soc. 21, 155–178. doi:10.1080/13600820701201731
IMO, 2012. International Shipping Facts and Figures – Information Resources on Trade, Safety, Security, Environment. Maritime Knowledge Centre 6 March 2012. Available from: http://www.imo.org/KnowledgeCentre/ShipsAndShippingFactsAndFigures/TheRoleandImportanceofInternationalShipping/Documents/International%20Shipping%20-%20Facts%20and%20Figures.pdf. Accessed 18.04.2012.
Imperial, M.T., 1999. Institutional Analysis and Ecosystem-Based Management: The Institutional Analysis and Development Framework. Environmental Management 24, 449–465. doi:10.1007/s002679900246
Irwin, L., 1997. Reasons as causes. The Web Site for Critical Realism. Available from: http://www.criticalrealism.com/?sitesig=WSCR&page=WSCR_060_WSCR_Glossary&subpage=WSCR_210_Reasons_as_Causes. Accessed from: 18.04.2014.

ISO 8402, 1994. Quality management and quality assurance. Available from: http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_detail_ics.htm?csnumber=20115. Accessed 18.04.2014.
Jackson, P. 2006. The Present as History. In Goodin, R.E., Tilly, C., (eds.) 2006. The Oxford Handbook of Contextual Political Analysis. Oxford University Press, USA, Oxford : New York. pp. 490 – 508.
Jalkanen, J.-P., Brink, A., Kalli, J., Pettersson, H., Kukkonen, J., Stipa, T., 2009. A modelling system for the exhaust emissions of marine traffic and its application in the Baltic Sea area. Atmos. Chem. Phys. 9, 9209–9223. doi:10.5194/acp-9-9209-2009
Jalkanen, J-P. and L. Johansson. 2013. Emissions from Baltic Sea shipping 2012. HELCOM Baltic Sea Environment Fact Sheets. Online. Available from: http://www.helcom.fi/baltic-sea-trends/environment-fact-sheets/. Accessed 18.04.2014.
Janesick, V.J., 2001. Intuition and Creativity: A Pas de Deux for Qualitative Researchers. Qualitative Inquiry 7, 531–540. doi:10.1177/107780040100700501
Jänicke, M., 2008. Ecological modernisation: new perspectives. Journal of Cleaner Production 16, 557–565. doi:10.1016/j.jclepro.2007.02.011
Jenisch, U. 2002. The Development of Environmental Standards for the Baltic Sea. In Ehlers et al. (eds.) 2002. Marine Issues: From a Scientific, Political, and Legal perspective. The Hague: Martinus Nijhoff Publishers. pp. 63-72.
Jentoft, S., Chuenpagdee, R., 2009. Fisheries and coastal governance as a wicked problem. Marine Policy 33, 553–560. doi:10.1016/j.marpol.2008.12.002
Jessop, B., 1998. The Rise of Governance and the Risks of Failure: the Case of Economic Development . International Social Science Journal 50, 29–45.
Jessop, B., 2002a. Governance and Meta-governance in the Face of Complexity: On the Roles of Requisite Variety, Reflexive Observation, and Romantic Irony in Participatory Governance, in: Heinelt, H., Getimis, P., Kafkalas, G., Smith, R., Swyngedouw, E. (Eds.), Participatory Governance in Multi-Level Context.
Jessop, B., 2002b. The Future of the Capitalist State, 1 edition. ed. Polity, Cambridge, UK : Malden, MA.
Jick, T.D., 1979. Mixing Qualitative and Quantitative Methods: Triangulation in Action. Administrative Science Quarterly 24, 602–611. doi:10.2307/2392366
Joas, M., Jahn, D., Kern, K., 2008. Governing a Common Sea: Environmental Policies in the Baltic Sea Region. Earthscan.
Jochim, A.E., May, P.J., 2010. Beyond Subsystems: Policy Regimes and Governance. Policy Studies Journal 38, 303–327. doi:10.1111/j.1541-0072.2010.00363.x
Joenniemi, P., 1993. Cooperation in the Baltic Sea Region. Taylor & Francis.
Johansson, L., Jalkanen, J.-P., Kalli, J., Kukkonen, J., 2013. The evolution of shipping emissions and the costs of recent and forthcoming emission regulations in the northern European emission control area. Atmos. Chem. Phys. Discuss. 13, 16113–16150. doi:10.5194/acpd-13-16113-2013
Johnson, S.P., Corcelle, G., 1989. The environmental policy of the European communities. London: Graham & Trotman.
Jones, S., Kirchsteiger, C., Bjerke, W., 1999. The importance of near miss reporting to further improve safety performance. Journal of Loss Prevention in the Process Industries 12, 59–67. doi:10.1016/S0950-4230(98)00038-2
Jordan, A., Wurzel, R., Zito, A.R., 2003. New Instruments of Environmental Governance?: National Experiences and Prospects. Psychology Press.
Kalli, J., Jalkanen, J.-P., Johansson, L., Repka, S., 2013. Atmospheric emissions of European SECA shipping: long-term projections. WMU J Marit Affairs 12, 129–145. doi:10.1007/s13437-013-0050-9
Kaps, H., 2004. Quality shipping — incentives, disincentives. WMU J Marit Affairs 3, 85–97. doi:10.1007/BF03195051
Kauppi, N., 2005. Democracy, Social Resources and Political Power in the European Union. Manchester University Press.
Keeley, J., Scoones, I., 2003. Understanding Environmental Policy Processes: Cases from Africa. London: Earthscan.
Keohane, R.O., Nye, J.S., 1977. Power and interdependence: world politics in transition. Little, Brown.
Kern, K., 2011. Governance For Sustainable Development in the Baltic Sea Region. Journal of Baltic Studies 42, 21–35. doi:10.1080/01629778.2011.538517
Kingston, C., 2007. Marine Insurance in Britain and America, 1720–1844: A Comparative Institutional Analysis. The Journal of Economic History 67, 379–409. doi:10.1017/S0022050707000149
Knapp, S., Franses, P.H., 2009. Does ratification matter and do major conventions improve safety and decrease pollution in shipping? Marine Policy 33, 826–846. doi:10.1016/j.marpol.2009.03.005
Kohler-Koch, B., 1996. Catching up with change: The transformation of governance in the European Union. Journal of European Public Policy 3, 359–380. doi:10.1080/13501769608407039
Kollock, P., 1999. The economies of online cooperation: Gifts and public goods in cyberspace. In M. Smith and P. Kollock (Eds), Communities in cyberspace. London: Routledge.
Kongsvik, T., Fenstad, J., Wendelborg, C., 2012. Between a rock and a hard place: Accident and near-miss reporting on offshore service vessels. Safety Science 50, 1839–1846. doi:10.1016/j.ssci.2012.02.003

Kooiman, J., 1993. Modern Governance: New Government-Society Interactions. London: SAGE.
Kooiman, J., 1999. Social-Political Governance. Public Management: An International Journal of Research and Theory 1, 67–92. doi:10.1080/14719037800000005
Kooiman, J., 2003a. Societal Governance, in: Katenhusen, I., Lamping, W. (Eds.), Demokratien in Europa. VS Verlag für Sozialwissenschaften, pp. 229–250.
Kooiman, J., 2003b. Governing as Governance, 1 edition. ed. London: SAGE.
Krasner, S.D., 1983. International Regimes. Cornell University Press.
Kujala, P., Hänninen, M., Arola, T., Ylitalo, J., 2009. Analysis of the marine traffic safety in the Gulf of Finland. Reliability Engineering & System Safety 94, 1349–1357. doi:10.1016/j.ress.2009.02.028
Kurki, M., 2007. Critical realism and causal analysis in international relations. Millenium: Journal of International Studies. 35(2), 361 – 378.
Kurki, M., Sinclair, A., 2010. Hidden in plain sight: Constructivist treatment of social context and its limitations. Int Polit 47, 1–25. doi:10.1057/ip.2009.29
Kuronen, J., Tapaninen, U., 2010. Evaluation of maritime safety policy instruments. WMU Journal Maritime Affairs 9, 45–61. doi:10.1007/BF03195165
Lam, W.F., 1998. Governing Irrigation Systems in Nepal: Institutions, Infrastructure, and Collective Action. Ics Press+, Oakland, Calif.
Langen, P., 2002. Clustering and performance: the case of maritime clustering in The Netherlands. Maritime Policy & Management 29, 209–221. doi:10.1080/03088830210132605
Langen, P., 2004. Governance in Seaport Clusters. Maritime Econ Logistics 6, 141–156. doi:10.1057/palgrave.mel.9100100
Lappalainen, J., Vepsäläinen, A., Salmi, K., Tapaninen, U., 2011. Incident reporting in Finnish shipping companies. WMU Journal Maritime Affairs 10, 167–181. doi:10.1007/s13437-011-0011-0
Lascoumes, P., Le Gales, P., 2007. Introduction: Understanding Public Policy through Its Instruments—From the Nature of Instruments to the Sociology of Public Policy Instrumentation. Governance 20, 1–21. doi:10.1111/j.1468-0491.2007.00342.x
Latour, B., 1993. We Have Never Been Modern. Cambridge: Harvard University Press.
Latour, B., 2005. Reassembling the Social - An Introduction to Actor-Network-Theory. Reassembling the Social - An Introduction to Actor-Network-Theory, by Bruno Latour, pp. 316. Foreword by Bruno Latour. Oxford University Press, Sep 2005. ISBN-10: 0199256047. ISBN-13: 9780199256044 -1.
Ledeneva, A.V., 2006. How Russia Really Works: The Informal Practices That Shaped Post-Soviet Politics and Business. Cornell University Press.
Leemans, E., Luiten, E., 2005. The Clean Ship: Towards an Integrated Approach of Sustainable Shipping. Stichting De Noordzee.
Leppäkoski, E., Gollasch, S., Gruszka, P., Ojaveer, H., Olenin, S., Panov, V., 2002. The Baltic—a sea of invaders. Can. J. Fish. Aquat. Sci. 59, 1175–1188. doi:10.1139/f02-089
Levi, M., 2002. Money Laundering and Its Regulation. Ann. Am. Acad. Pol. Soc. Sci. 582, 181–194. doi:10.1177/000271620258200113
Levin, K., Cashore, B., Bernstein, S., Auld, G., 2012. Overcoming the tragedy of super wicked problems: constraining our future selves to ameliorate global climate change. Policy Sci 45, 123–152. doi:10.1007/s11077-012-9151-0
Levy, M. 1997. A model, a method and a map: rational choice in comparative and historical analysis. In Lichbach, M.I., Zuckerman, A.S., (eds.) Comparative Politics: Rationality, Culture, and Structure. Cambridge University Press. pp. 19-41.
Levy, M. 2004. An analytic narrative approach to puzzels and problems. In Shapiro, I., Smith, R.M., Masoud, T.E., Problems and Methods in the Study of Politics. Cambridge University Press. pp. 201-226.
Lieberman, E.S., 2005. Nested Analysis as a Mixed-Method Strategy for Comparative Research. American Political Science Review 99, 435–452. doi:10.1017/S0003055405051762
Lieberman, E.S., 2011. The perils of polycentric governance of infectious disease in South Africa. Social Science & Medicine 73, 676–684. doi:10.1016/j.socscimed.2011.06.012
Liebold, R., Trinczek, R., 2009. Experteninterview, in: Kühl, S., Strodtholz, P., Taffertshofer, A. (Eds.), Handbuch Methoden der Organisationsforschung. VS Verlag für Sozialwissenschaften, pp. 32–56.
Lillie, N., 2013. A Global Union for Global Workers: Collective Bargaining and Regulatory Politics in Maritime Shipping. London: Routledge.
Lincoln, Y.S., Guba, E., 1985. Naturalistic Inquiry. London: SAGE Publications.
Linden, O., Chircop A., Pourzanjani M., Schröder J. U., Raaymakers S., 2006. PSSA in the Baltic Sea: Present situation and future possibilities. 28., Malmö: World Maritime University.
Little, D., 1998. Microfoundations, Method, and Causation: On the Philosophy of the Social Sciences. Transaction Publishers.
Little, D., 2012. Response to Commentators. Sociologica 1/2012. doi:10.2383/36904.
Lowndes, V., Skelcher, C., 1998. The Dynamics of Multi-organizational Partnerships: an Analysis of Changing Modes of

Governance. Public Administration 76, 313–333. doi:10.1111/1467-9299.00103
Lubell, M., 2002. Environmental Activism as Collective Action. Environment and Behavior 34, 431–454. doi:10.1177/00116502034004002
Lubell, M., Vedlitz, A., Zahran, S., Alston, L.T., 2006. Collective Action, Environmental Activism, and Air Quality Policy. Political Research Quarterly 59, 149–160. doi:10.1177/106591290605900113
Lubell, M., Zahran, S., Vedlitz, A., 2007. Collective Action and Citizen Responses to Global Warming. Polit Behav 29, 391–413. doi:10.1007/s11109-006-9025-2
Lun, Y.H.V., Hilmola, O.-P., Goulielmos, A.M., Lai, K.-h., Cheng, T.C.E., 2013. Oil Transport Management. London: Springer.
M'Gonigle, R.M., McGonigle, R.M., Zacher, M.W., 1981. Pollution, Politics, and International Law: Tankers at Sea. University of California Press.
Mahoney, J., Goertz, G., 2006. A Tale of Two Cultures: Contrasting Quantitative and Qualitative Research. Political Analysis 14, 227–249. doi:10.1093/pan/mpj017
Maravic, P. von, 2012. Limits of knowing or the consequences of difficult-access problems for multi-method research and public policy. Policy Sci 45, 153–168. doi:10.1007/s11077-012-9147-9
March, J.G., Olsen, J.P., 1984. The New Institutionalism: Organizational Factors in Political Life. The American Political Science Review 78, 734–749. doi:10.2307/1961840
Matthias, V., Bewersdorff, I., Aulinger, A., Quante, M., 2010. The contribution of ship emissions to air pollution in the North Sea regions. Environmental Pollution. 6, 2241-2250
McCarthy, E., 2004. International Regulation of Underwater Sound: Establishing Rules and Standards to Address Ocean Noise Pollution. Springer.
McCormack, c., 2004. Storying stories: a narrative approach to in-depth interview conversations. International Journal of Social Research Methodology 7, 219–236. doi:10.1080/13645570210166382
McCormick, J., 2001. Environmental Policy in the European Union. Palgrave Macmillan.
McGinnis, M.D., 1999. Polycentricity and Local Public Economies: Readings from the Workshop in Political Theory and Policy Analysis. University of Michigan Press.
McGinnis, M.D., 2000. Polycentric Games and Institutions: Readings from the Workshop in Political Theory and Policy Analysis. University of Michigan Press.
McGinnis, M.D., 2011. Networks of Adjacent Action Situations in Polycentric Governance. Policy Studies Journal 39, 51–78. doi:10.1111/j.1541-0072.2010.00396.x
McGinnis, M.D., Ostrom, E., 2012. Reflections on Vincent Ostrom, Public Administration, and Polycentricity. Public Administration Review 72, 15–25. doi:10.1111/j.1540-6210.2011.02488.x
Meadows, D.H., Meadows, D.L., Randers, J., Behrens W.W., 1972. Limits to Growth. New York: New American Library.
Merton, R.K., 1936. The Unanticipated Consequences of Purposive Social Action. American Sociological Review 1, 894. doi:10.2307/2084615
Merton, R.K., 1949 (reprint 1968). Social Theory and Social Structure. Simon and Schuster.
Meuleman, L., 2012. Transgovernance: Advancing Sustainability Governance, 2013 edition. New York: Springer.
Meyer, J.W., Boli, J., Thomas, George M., Ramirez, F.O., 1997. World Society and the Nation-State. American Journal of Sociology 103, 144–181. doi:10.1086/ajs.1997.103.issue-1
Michael, S., 2005. The promise of appreciative inquiry as an interview tool for field research. Development in Practice 15, 222–230. doi:10.1080/09614520500042094
Midttun, A., Gjølberg, M., Kourula, A., Sweet, S., Vallentin, S., 2012. Public Policies for Corporate Social Responsibility in Four Nordic Countries: Harmony of Goals and Conflict of Means. Business Society 0007650312450848. doi:10.1177/0007650312450848
Miles, M.B., Huberman, A.M., 1994. Qualitative Data Analysis: An Expanded Sourcebook. SAGE Publications.
Mitchell, R.B., 1994. Intentional Oil Pollution at Sea: Environmental Policy and Treaty Compliance. MIT Press.
Mitchell, R.K., Agle, B.R., Wood, D.J., 1997. Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of who and What Really Counts. ACAD MANAGE REV 22, 853–886. doi:10.5465/AMR.1997.9711022105
Mol, A., 2010. Actor-Network Theory: sensitive terms and enduring tensions. Köln. Z. Für Soziol. Sozialpsychologie Sonderh. 50, 253–269.
Mol, A., Law, J., 1994. Regions, Networks and Fluids: Anaemia and Social Topology. Soc. Stud. Sci. 24, 641–671
Mueller, M., 2004. Ruling the Root: Internet Governance and the Taming of Cyberspace. MIT Press.
Mueller, M.L., 2010. Networks and States: The Global Politics of Internet Governance. MIT Press.
Nagel, T., 1989. The View From Nowhere. Oxford University Press.
Nash, J.F., 1950. The Bargaining Problem. Econometrica 18, 155. doi:10.2307/1907266
Nee, V. 2001. Sources of New Institutionalism. In M. Brinton and V. Nee, V (eds.) The New Institutionalism in Sociology. Stanford University Press. pp. 1-16.
Neilson, J., Pritchard, B., 2011. Value Chain Struggles: Institutions and Governance in the Plantation Districts of South India. John Wiley & Sons.

Ng, A.K.Y., Hall, P.V., Pallis, A.A., 2013. Guest editors' introduction: institutions and the transformation of transport nodes. Journal of Transport Geography, Institutions and the Transformation of Transport Nodes 27, 1–3. doi:10.1016/j.jtrangeo.2012.08.010

Ng, A.K.Y., Pallis, A.A., 2010. Port governance reforms in diversified institutional frameworks: generic solutions, implementation asymmetries. Environment and Planning A 42, 2147–2167. doi:10.1068/a42514

Ng, A.K.Y., Song, S., 2010. The environmental impacts of pollutants generated by routine shipping operations on ports. Ocean & Coastal Management 53, 301–311. doi:10.1016/j.ocecoaman.2010.03.002

Nikula, P., Tynkkynen, V.-P., 2007. Risks in oil transportation in the Gulf of Finland. 'Not a question of if – but when'. Working Paper 7. CIVPRO, Civil Protection Network, Aleksanteri Institute, Helsinki. Finland.

NORDREGIO, 2009. The Baltic Sea region organisations. An overview completed by José Sterling. Available from: http://www.nordregio.se/en/Metameny/About-Nordregio/Journal-of-Nordregio/2009/Journal-of-Nordregio-no-1-2009/THE-BALTIC-SEA-REGION-ORGANISATIONS/. Accessed: 18.04.2014.

North, D.C., 1990. Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press.

North, D.C., 1991. Institutions. The Journal of Economic Perspectives 5, 97–112.

Obando-Rojas, B., Welsh, I., Bloor, M., Lane, T., Badigannavar, V., Maguire, M., 2004. The political economy of fraud in a globalised industry: the case of seafarers' certifications. Sociol. Rev. 52, 295–313. doi:10.1111/j.1467-954X.2004.00481.x

Oberthür, S., Gehring, T., 2006. Institutional Interaction in Global Environmental Governance: Synergy and Conflict Among International and EU Policies. MIT Press.

OECD, 1997. Evaluating Economic Instruments for Environmental Policy. OECD Publishing.

OECD, 2011. Environmental Impacts of International Shipping. The Role of Ports: The Role of Ports. OECD Publishing.

Oldfield, J.D., 2005. Russian Nature: Exploring the Environmental Consequences of Societal Change. Burlington: Ashgate.

Oliver, P.E., 1993. Formal Models of Collective Action. Annual Review of Sociology 19, 271–300. doi:10.1146/annurev.so.19.080193.001415

Olson, M., 1965. The Logic of Collective Action: Public Goods and the Theory of Groups. Harvard: Harvard University Press.

Oltedal, H.A., McArthur, D.P., 2011. Reporting practices in merchant shipping, and the identification of influencing factors. Safety Science 49, 331–338. doi:10.1016/j.ssci.2010.09.011

Onwuegbuzie, A.J., Dickinson, W.B., 2008. Mixed methods analysis and information visualization: Graphical display for effective communication of research results". Qualitative report (2160-3715), 13 (2), p. 204-225.

Osborne, S.P., 2006. The New Public Governance? Public Management Review 8, 377–387. doi:10.1080/14719030600853022

Ostrom, E., 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge: Cambridge University Press.

Ostrom, E., 1998. A Behavioral Approach to the Rational Choice Theory of Collective Action: Presidential Address, American Political Science Association, 1997. The American Political Science Review 92, 1. doi:10.2307/2585925

Ostrom, E., 2000. The Danger of Self-Evident Truths. PS: Political Science & Politics 33, 33–46. doi:10.2307/420774

Ostrom, E. 2004. Understanding Collective Action. In Collective Action and Property Right for Sustainable Development. FOCUS 11(2). International food Policy Research institute. Available from: http://www.ifpri.org/sites/default/files/publications/focus11.pdf. Accessed 18.04.2014.

Ostrom, E., 2005. Understanding Institutional Diversity. Princeton University Press, Princeton.

Ostrom, E., 2008. Doing Institutional Analysis: Digging Deeper than Markets and Hierarchies, in: Ménard, C., Shirley, M.M. (Eds.), Handbook of New Institutional Economics. Springer Berlin Heidelberg, pp. 819–848.

Ostrom, E., 2009. A General Framework for Analyzing Sustainability of Social-Ecological Systems. Science 325, 419–422. doi:10.1126/science.1172133

Ostrom, E., 2010a. Analyzing collective action. Agricultural Economics 41, 155–166. doi:10.1111/j.1574-0862.2010.00497.x

Ostrom, E., 2010b. Beyond Markets and States: Polycentric Governance of Complex Economic Systems. American Economic Review 100, 641–672. doi:10.1257/aer.100.3.641

Ostrom, E., 2011. Background on the Institutional Analysis and Development Framework. Policy Studies Journal 39, 7–27. doi:10.1111/j.1541-0072.2010.00394.x

Ostrom, V., 1991. Polycentricity: The Structural Basis of Self-Governing Systems. In The Meaning of Americal Federalism: Constituting a Self-Governing Society. San Francisco: ICS Press. pp. 223-244.

Ostrom, V., Ostrom, E., 1971. Public Choice: A Different Approach to the Study of Public Administration. Public Administration Review 31, 203–216. doi:10.2307/974676

Ostrom, V., Tiebout, C.M., Warren, R., 1961. The Organization of Government in Metropolitan Areas: A Theoretical Inquiry. The American Political Science Review 55, 831. doi:10.2307/1952530

Oxenstierna, S., Tynkkynen, V.-P., 2013. Russian Energy and Security Up To 2030. Taylor & Francis Group.
Pallis, A.A., 2006. EU Port Policy: Implications for Port Governance in Europe. Research in Transportation Economics, Devolution, Port Governance and Port Performance 17, Chapter 21, pp. 479–495. doi:10.1016/S0739-8859(06)17021-3
Pallis, A.A., 2007. Maritime interests in the EU policy-making: Structures, practices, and governability of collective action. WMU J Marit Affairs 6, 3–20. doi:10.1007/BF03195086
Parsons, T., 1937 (reprint 1949). The structure of social action: a study in social theory with special reference to a group of recent European writers. Free Press.
Parsons, T., 1991. The Social System. London: Psychology Press.
Pattberg, P., 2005. The Institutionalization of Private Governance: How Business and Nonprofit Organizations Agree on Transnational Rules. Governance 18, 589–610. doi:10.1111/j.1468-0491.2005.00293.x
Pattberg, P.H., 2007. Private institutions and global governance: the new politics of environmental sustainability. Edward Elgar.
Patton, M.Q., 2002. Two Decades of Developments in Qualitative Inquiry A Personal, Experiential Perspective. Qualitative Social Work 1, 261–283. doi:10.1177/1473325002001003636
Patton, M.Q., 2005. Qualitative Research, in: Encyclopedia of Statistics in Behavioral Science. John Wiley & Sons, Ltd.
Pawlik, T., Gaffron, P. & Drewes, P.A., 2012. Corporate Social Responsibility in Maritime Logistics. In Song, D-W. & Panayides, P.M. (ed.) Maritime logistics: Contemporary issues. Emerald Group Publishing Limited. UK 2012.
Payoyo, P.B., 1994. Implementation of international conventions through port state control: an assessment. Marine Policy 18, 379–392. doi:10.1016/0308-597X(94)90034-5
Peters, D., 2003. Cohesion, Polycentricity, Missing Links and Bottlenecks: Conflicting Spatial Storylines for Pan-European Transport Investments. European Planning Studies 11, 317–339. doi:10.1080/09654310303638
Pierson, P., 2000. The Limits of Design: Explaining Institutional Origins and Change. Governance 13, 475–499. doi:10.1111/0952-1895.00142
Pierson, P., 2004. Politics in Time: History, Institutions, and Social Analysis. Princeton: Princeton University Press.
Polanyi, K., 1944. The Great Transformation: The Political and Economic Origins of Our Time. Beacon Press.
Polanyi, M., 1951. The Logic of Liberty: Reflections and Rejoinders. University of Chicago Press.
Ponte, S., Gibbon, P., 2005. Quality standards, conventions and the governance of global value chains. Economy and Society 34, 1–31. doi:10.1080/0308514042000329315
Portney, P.R., Stavins, R.N., 2000. Public Policies for Environmental Protection. Washingtin, DC: Resources for the Future.
Princen, T., Finger, M., Clark, M.L., Manno, J.P., 1994. Environmental NGOs in world politics: linking the local and the global. NY: Routledge.
Psaraftis, H.N., Kontovas, C.A., 2009. CO2 emission statistics for the world commercial fleet. WMU J Marit Affairs 8, 1–25. doi:10.1007/BF03195150
Putnam, R.D., 1988. Diplomacy and domestic politics: the logic of two-level games. International Organization 42, 427–460. doi:10.1017/S0020818300027697
Rayner, T., Jordan, A., 2013. The European Union: the polycentric climate policy leader? WIREs Clim Change 4, 75–90. doi:10.1002/wcc.205
Rhodes, R. a. W., 1996. The New Governance: Governing without Government. Political Studies 44, 652–667. doi:10.1111/j.1467-9248.1996.tb01747.x
RightShip, 2014. About RightShip. Available from: http://site.rightship.com/about/who-we-are/. Accessed 18.04.2014.
Risse, T., 2012. Governance in Areas of Limited Statehood. In D.Levi-Faur (ed.) The Oxford Handbook of Governance. Oxford: Oxford University Press. Ch. 49.
Rittel, H. and M. Webber, 1973. Dilemmas in a general theory of planning. Policy Sciences 4: 155-169.
Robichau, R.W., 2011. The Mosaic of Governance: Creating a Picture with Definitions, Theories, and Debates. Policy Studies Journal 39, 113–131. doi:10.1111/j.1541-0072.2010.00389_8.x
Roe, M., 2007. Shipping, Policy and Multi-Level Governance. Marit. Econ. Logist. 9, 84–103. doi:10.1057/palgrave.mel.9100173
Roe, M., 2008. Safety, security, the environment and shipping: The problem of making effective policies. WMU Journal of Maritime Affairs 7, 263–279. doi:10.1007/BF03195135
Roe, M., 2009. Maritime governance and policy-making failure in the European Union. International Journal of Shipping and Transport Logistics 1, 1–19. doi:10.1504/IJSTL.2009.021973
Roe, M., 2012. Maritime Governance and Policy-Making, 2013 edition. ed. Springer, New York.
Rosenau, J.N., 1997. Along the Domestic-Foreign Frontier: Exploring Governance in a Turbulent World. Cambridge: Cambridge University Press.
Rosenau, J.N., 2003. Distant Proximities: Dynamics Beyond Globalization. Princeton: Princeton University Press.
Rosenau, J.N., Czempiel, E.O., 1992. Governance Without Government: Order and Change in World Politics. Cambridge: Cambridge University Press.
Ross, D., 2005. Ship sources of ambient noise. IEEE Journal of Oceanic Engineering 30, 257–261.

doi:10.1109/JOE.2005.850879
Rubin, H.J., Rubin, I.S., 2012. Qualitative Interviewing: The Art of Hearing Data. London: SAGE Publications.
Ruggie, J.G., 1993. Territoriality and beyond: problematizing modernity in international relations. International Organization 47, 139–174. doi:10.1017/S0020818300004732
Rutherford, M., 1996. Institutions in Economics: The Old and the New Institutionalism. Cambridge: Cambridge University Press.
Saaristo, A., 2006. There Is No Escape from Philosophy Collective Intentionality and Empirical Social Science. Philosophy of the Social Sciences 36, 40–66. doi:10.1177/0048393105284170
Sakwa, R., 2008. Russian Politics and Society. London: Routledge.
Sampson, H., Bloor, M., 2007. When Jack Gets out of the Box: The Problems of Regulating a Global Industry. Sociology 41, 551–569. doi:10.1177/0038038507076623
Samuelson, P.A., 1948. Consumption Theory in Terms of Revealed Preference. Economica, New Series 15, 243–253. doi:10.2307/2549561
Sandholtz, W., Sweet, A.S., 1998. European Integration and Supranational Governance. Oxford: Oxford University Press.
Scharpf, F.W., 1994. Games Real Actors Could Play Positive and Negative Coordination in Embedded Negotiations. Journal of Theoretical Politics 6, 27–53. doi:10.1177/0951692894006001002
Schumacher, F. 1973. Small Is Beautiful. Economics as If People Mattered. London: Blond & Briggs.
Scott, James W. 1997 'Environmental Protection and Interregional Co-operation in the Baltic Sea Region: The VASAB Initiative', in Gerald Blake et al. (eds.), International Boundaries and Environmental Security: Frameworks for Regional Co-operation. London: Kluwer Law International, pp.121–38.
Seidman, I., 2005. Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences, 3 edition. ed. Teachers College Press, New York.
Selkou, E., Roe, M., 2004. Globalisation, Policy And Shipping. Fordism, Post-Fordism And The European Union Maritime Sector. Cheltenham: Edward Elgar.
Shinohara, M., 2005. Quality Shipping and Incentive Schemes: From the Perspective of the Institutional Economics. Maritime Economics &Logistics 7, 281–295. doi:10.1057/palgrave.mel.9100138
Simon, H., 1972. Theories of bounded rationality. In McGuire, C.B., Radner, R., Arrow, K.J., 1972. Decision and organization: A volume in honor of Jacob Marschak. North-Holland Pub. C, pp.161-176.
Skocpol T, Pierson P. "Historical Institutionalism in Contemporary Political Science". In: Katznelson I, Milner HV Political Science: State of the Discipline. New York: W.W. Norton; 2002. pp. 693-721.
Skovgaard, M., Felbo-Kolding, M., Larsen, P.H., 2007. CSR-kommunikation med omtanke. Available from: http://diggy.ruc.dk/bitstream/1800/2562/1/Samlet%20rapport%2023%20maj%2023%2010.pdf. Accessed 18.04.2014.
Sletmo, G.K., 2001. The End of National Shipping Policy? A Historical Perspective on Shipping Policy in a Global Economy. International Journal of Maritime Economics 3, 333–350.
Small, M.L., 2011. How to Conduct a Mixed Methods Study: Recent Trends in a Rapidly Growing Literature. Annual Review of Sociology 37, 57–86. doi:10.1146/annurev.soc.012809.102657
Smith, H.D., 1995. The environmental management of shipping. Marine Policy, Shipping, Safety and the Environment: A Post-Donaldson Analysis 19, 503–508. doi:10.1016/0308-597X(95)00033-3
Soares, C.G., Teixeira, A.P., 2001. Risk assessment in maritime transportation. Reliability Engineering & System Safety 74, 299–309. doi:10.1016/S0951-8320(01)00104-1
Sørensen, E., 2006. Metagovernance The Changing Role of Politicians in Processes of Democratic Governance. The American Review of Public Administration 36, 98–114. doi:10.1177/0275074005282584
Sørensen, E., Torfing, J., 2005. The Democratic Anchorage of Governance Networks. Scandinavian Political Studies 28, 195–218. doi:10.1111/j.1467-9477.2005.00129.x
Speck, S., Andersen, M., Nielsen, H., Ryelund. A. and C. Smith. 2006. The Use of Economic Instruments in Nordic and Baltic Environmental Policy 2001-2005, TemaNord 2006:525, Nordic Council of Ministers.
Srivastava, C.P., 1989. Safer ships and cleaner oceans: thirty years' work of the international maritime organization. Transport Reviews 9, 45–57. doi:10.1080/01441648908716707
Stoker, G., 1998. Governance as theory: five propositions. International Social Science Journal 50, 17–28. doi:10.1111/1468-2451.00106
Storgård, J., Erdogan, I., Lappalainen, J., Tapaninen, U., 2012. Developing Incident and Near Miss Reporting in the Maritime Industry–A Case Study on the Baltic Sea. Procedia - Social and Behavioral Sciences, Transport Research Arena 2012 48, 1010–1021. doi:10.1016/j.sbspro.2012.06.1078
Suárez de Vivero, J.L., Rodríguez Mateos, J.C., Florido del Corral, D., 2009. Geopolitical factors of maritime policies and marine spatial planning: State, regions, and geographical planning scope. Marine Policy 33, 624–634. doi:10.1016/j.marpol.2008.12.010
Tan, A.K.-J., 2006. Vessel-Source Marine Pollution: The Law and Politics of International Regulation. Cambridge : Cambridge University Press.
Tang, S., 2011. Foundational Paradigms of Social Sciences. Philosophy of the Social Sciences 41, 211–249.

doi:10.1177/0048393109355294
Tansey, O., 2007. Process Tracing and Elite Interviewing: A Case for Non-probability Sampling. PS: Political Science & Politics 40, 765–772. doi:10.1017/S1049096507071211
Tarrow, S., 1995. Bridging the Quantitative-Qualitative Divide in Political Science. American Political Science Review 89, 471–474. doi:10.2307/2082444
Taylor, M., 1976. Anarchy and Cooperation, n edition. ed. John Wiley & Sons Ltd, London ; New York.
The Baltic Sea Portal, 2009. HELCOM achieves another decrease in the number of illicit oil spills in the Baltic. 24.8.2009. http://www.itameriportaali.fi/en/ajankohtaista/uutisia_muualta/2009/en_GB/oil/
Thelen, K., 1999. Historical Institutionalism in Comparative Politics. Annual Review of Political Science 2, 369–404. doi:10.1146/annurev.polisci.2.1.369
Tilly, C., 2006. Why and how history matters. In Goodin and Tilly (eds.) The Oxford handbook of contextual political analysis. Oxford: Oxford University Press. pp. 417-437.
Tilly, C., 2001. Mechanisms in Political Processes. Annual Review of Political Science 4, 21–41. doi:10.1146/annurev.polisci.4.1.21
Toonen, T., 2010. Resilience in Public Administration: The Work of Elinor and Vincent Ostrom from a Public Administration Perspective. Public Administration Review 70, 193–202. doi:10.1111/j.1540-6210.2010.02147.x
Torfing, J., Peters, B.G., Pierre, J., Sorensen, E., 2012. Interactive Governance: Advancing the Paradigm. Oxford University Press, USA, Oxford ; New York.
Torfing, J., Triantafillou, P., 2013. Interactive Policy Making, Metagovernance and Democracy. ECPR Press.
Trucco, P., Cagno, E., Ruggeri, F., Grande, O., 2008. A Bayesian Belief Network modelling of organisational factors in risk analysis: A case study in maritime transportation. Reliability Engineering & System Safety 93, 845–856. doi:10.1016/j.ress.2007.03.035
Tsebelis, G., 1990. Nested Games: Rational Choice in Comparative Politics. University of California Press.
Tsingou, E., 2010. Global financial governance and the developing anti-money laundering regime: What lessons for International Political Economy? Int. Polit. 47, 617–637. doi:10.1057/ip.2010.32
Tuomela, R., 1995. The Importance of Us: A Philosophical Study of Basic Social Notions. Stanford University Press.
U.S. Congress, Office of Technology Assessment (OTA), 1995. Environmental Policy Tools: A User's Guide, OTA-ENV-634. Washington, DC: U.S. Government Printing Office.
Van Der Horst, M.R., De Langen, P.W., 2008. Coordination in Hinterland Transport Chains: A Major Challenge for the Seaport Community. Maritime Econ Logistics 10, 108–129. doi:10.1057/palgrave.mel.9100194
Varone, F., Nahrath, S., Aubin, D., Gerber, J.-D., 2013. Functional regulatory spaces. Policy Sci 46, 311–333. doi:10.1007/s11077-013-9174-1
Wagner, R.E., 2005. Self-governance, polycentrism, and federalism: recurring themes in Vincent Ostrom's scholarly oeuvre. Journal of Econ Behavior & Org, 57, 173–188. (Polycentric Political Economy: A Festschrift for Elinor & Vincent Ostrom) doi:10.1016/j.jebo.2004.06.015
Wall, D., 1994. Green History: A Reader in Environmental Literature, Philosophy, and Politics. Routledge.
Wang, J.J., Ng, A.K.-Y., Olivier, D., 2004. Port governance in China: a review of policies in an era of internationalizing port management practices. Transport Policy 11, 237–250. doi:10.1016/j.tranpol.2003.11.003
Wankhade, L., Dabade, B., 2010. Quality Uncertainty and Perception: Information Asymmetry and Management of Quality Uncertainty and Quality Perception. Springer.
Wapner, P. 1996. Environmental Activism and World Civic Politics. Albany: State University of New York Press.
Webb, E. J., Campbell, D. T., Schwartz, R. D., and Sechrest, L., 1966. Unobtrusive Measures: nonreactive research in the social sciences, Chicago, Rand McNally.
Weber, E., 2008. The Debate between Causal Realism and Causal Constructivism: Metaphilosophical Reflections. Philosophica, 81, 59 – 71.
Weber, M., 1922 (reprint 1978). Economy and Society: An Outline of Interpretive Sociology. University of California Press.
Weber, M., 2008. Causes without Mechanisms: Experimental Regularities, Physical Laws, and Neuroscientific Explanation. Philosophy of Science 75, 995–1007. doi:10.1086/598956
Weidner, H., Jänicke, M., Jörgens, H., 2002. Capacity Building in National Environmental Policy: A Comparative Study of 17 Countries. Springer.
Whittemore, R., Chase, S.K., Mandle, C.L., 2001. Validity in Qualitative Research. Qual Health Res 11, 522–537. doi:10.1177/104973201129119299
Williamson, A., Lombardi, D.A., Folkard, S., Stutts, J., Courtney, T.K., Connor, J.L., 2011. The link between fatigue and safety. Accident Analysis & Prevention 43, 498–515. doi:10.1016/j.aap.2009.11.011
Williamson, O.E., 2000. The New Institutional Economics: Taking Stock, Looking Ahead. Journal of Economic Literature 38, 595–613. doi:10.1257/jel.38.3.595
Wuisan, L., van Leeuwen, J., van Koppen, C.S.A., 2012. Greening international shipping through private governance: A case study of the Clean Shipping Project. Marine Policy 36, 165–173.
WWF, 2003. WWF Demands Rules For Shipping in the Baltic, June 04, 2003. Available from:

http://www.wwf.eu/news.cfm?7326/WWF-demands-tougher-rules-for-shipping-in-the-Baltic. Accessed 18.04.2014.
Yliskylä-Peuralahti, J., Gritsenko, D. and Viertola J., forthcoming. Corporate Social Responsibility and Quality Governance in Shipping". Ocean Yearbook, 27 (in press).
Yliskylä-Peuralahti, J., Gritsenko, D., 2014. Binding rules or voluntary actions? A conceptual framework for CSR in shipping. WMU Journal of Maritime Affairs 1–18. doi:10.1007/s13437-014-0059-8
Young, O.R., 1982. Regime dynamics: the rise and fall of international regimes. International Organization 36, 277–297. doi:10.1017/S0020818300018956.
Young, O. R. 1994. International Governance: Protecting the Environment in a Stateless Society. Ithaca, N.Y.: Cornell University Press.
Young, O.R., 2002. The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale. MIT press.
Young, O. R. and G.Osherenko (eds.). 1993. Polar Politics: Creating International Environmental Regimes. Ithaca, N.Y.: Cornell University Press.
Zacher, M.W., 1999. Uniting Nations: Global regimes and the United Nations System. In R. Vayrynen (Ed.), Globalization and global governance. pp. 47-66.
Zeben, V., W, J.A., 2013. Research Agenda for a Polycentric European Union (SSRN Scholarly Paper No. ID 2261006). Social Science Research Network, Rochester, NY.
Zurn, M. 1997. The Rise of International Environmental Politics: A Review of Current Research World Politics 50 (4): 617-649.